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Precision SHOOTING

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COVER PHOTO

The new covered firing point of the Ridge Sportsman Club near Rochester, New York. The 10 plywood benches for either right or left hand shooters are movable, but don't get the idea that they are not solid—I have never shot from a steadier bench.

We hold 3 or 4 unregistered shoots a year for members only. Attendance runs around 20 to 25 out of 50 members. We shoot five 5-shot matches at 100 yards and five 5-shot matches at 200 yards, with one warm-up match for each range.

The earth moving and reconstruction of the range is largely due to the enthusiasm and hard work of our President, Ted Boughton. The members are grateful for his efforts.

John Collins
Rochester, New York

HI-VEL #2 POWDER DISCONTINUED

In its November News Letter to its dealers, Precision Tool and Gun Co., South Lansing, N. Y., mentions that: "HERCULES has announced the discontinuance of Hi-Vel #2 powder."

Probably Hi-Vel #2 will be available from dealers stocks for some time to come but the end of that once popular rifle powder seems to be in sight.

P. H .T.

STRETCH-STRAIGHTENING RIFLE BARRELS

A method of "stretch-straightening" rifle barrels has been proven feasible in a test made at Springfield Armory. The method and results are reported as follows:

"A 200,000-pounds-per-square-inch-capacity tensile testing machine having a work length sufficient to handle the barrel was available at Springfield Armory. Stretch-straightening operation was performed on the caliber .14 barrel.

"Barrel dimensions before straightening were 1.112 inch outside diameter, 0.134-inch bore diameter, and 0.1395-inch groove diameter. End plugs, in the bore, were inserted to prevent bore collapse during the operation.

"Reference marks were placed on the barrel blank for 24 inches of its length. The barrel had a compound or 'corkscrew' type of bend which, when gauged, indicated a 0.030 to 0.045-inch deviation from a straight line.

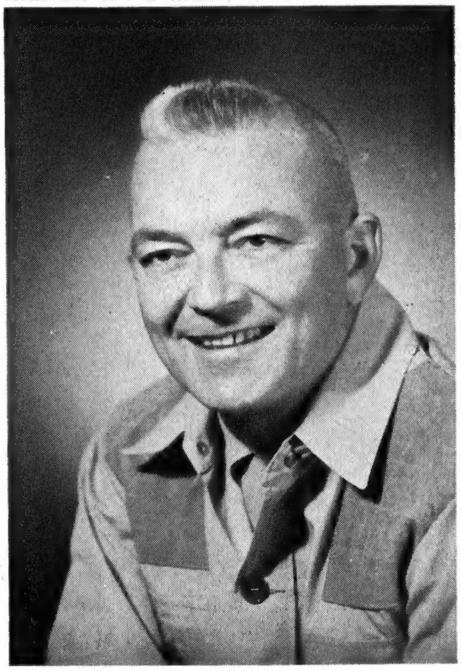
"The barrel was stretched approximately ⅜ of an inch or 1.56 per cent above its elastic limit. The barrel was then straight to an indicator reading 0.002 to 0.003 inch which is acceptable.

"The dimensions of the barrel were now 1.098 to 1.100-inch outside diameter, 0.1335-inch bore diameter, and 1.1390-inch groove diameter. The lead or pitch of rifling was elongated 1.56 percent which is still within tolerance. This tube can be used to produce a satisfactory barrel after removal of the mutilated ends caused by the machine jaws.

"Allowance can be made for the change in outside diameter, and in the bore and groove diameters, as well as in the rifling twist, to produce a truly straight barrel that will remain straight throughout its service life.

"This limited study indicates that definite improvements over previous methods of barrel straightening are possible by use of this process."

(Editor's comment: This test indicates that this method of straightening rifle barrels is possible and that designs of special machines for performing the operation might make it practical. However, whether or not the large quantity manufacturers of rifle barrels may consider this method feasible for their operations remains to be seen.)



George Fairchild

FAIRCHILD LEAVES CCI

George Fairchild has advised that he has resigned as Vice-President for Sales with Cascade Cartridge, Inc. and that he, in company with W. Robert Pomeroy of Lewiston, has been appointed sole U. S. A. Distributor of DWM ammunition and Obendorf Muser Rifles.

Fairchild's present address is 330 Main Street, Lewiston, Idaho.

RELOADING CLINICS

The Reloading Clinics conducted by Ray Speer of Speer, Inc., Fred Huntington of RCBS, and George Fairchild of Cascade Cartridge, Inc. last winter had such a successful reception that they will be repeated during February 1965. Factory representatives of other reloading equipment and component manufactures will assist in the program this coming winter.

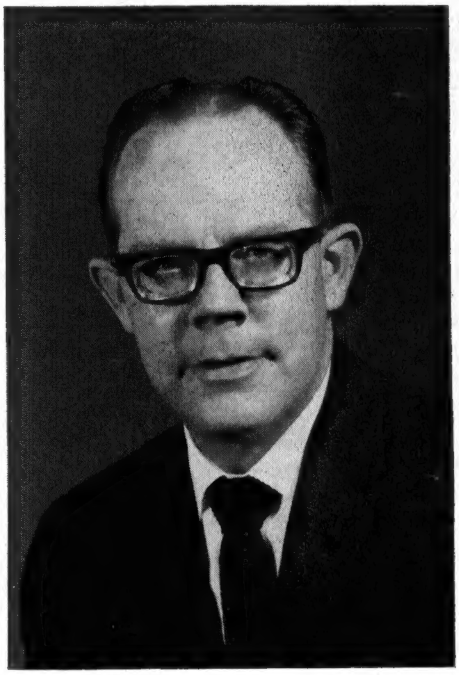
All of the clinics will be open to the public and individual reloaders as well as dealers are invited to attend. This is an opportunity for reloaders in the localities to get questions answered by the manufacturers, as well as picking up possible new information and "kinks."

The Clinic schedule for 1965 is:

Saturday, February 6, 1965—Williams Gun Sight, Davison, Michigan.

Monday, Feb. 8, 1965—Mathews and Boucher, Inc., 26 Flint Street, Rochester, New York.

ENTER NOW!
49th AMERICAN SMALLBORE RECORD POSTAL MATCHES
Individual—Team
Senior Match—100 shots offhand
College Match—50 shots offhand
Junior Match—20 shots each prone—offhand
Sub Jr. Match (under 14) 50 shots prone
December to April
Entry blanks—Blue Trail Range
316 N. Branford Rd.,
E. Wallingford, Conn.



W. Robert Pomeroy

Tuesday, Feb. 9, 1965—Precision Tool and Gun, Ithaca, New York.

Thursday, Feb. 11, 1965—Ray's Sport Shop, Hi-Way 22, Scotch Plains, New Jersey.

Friday, Feb. 12, 1965—Romig's Guns and Loads, 726 Chow Street, Allentown, Penna.

Saturday, Feb. 13, 1965—Paul Jaegers, 211 Leedom Street, Jenkintown, Penna.

Monday, Feb. 15, 1965—Arthur Cook Supply Corporation, Box 1238, Laurel, Maryland.

Wednesday, Feb. 17, 1965—Aurand's, 229-231 E. 3rd Street, Lewistown, Penna.

Friday, Feb. 19, 1965—Dayton Gun Headquarters, 2306 No. Main Street, Dayton, Ohio.

Saturday, Feb. 20, 1965—Indianapolis, Indiana, Dealer Group.

Monday, Feb. 22, 1965—Gil Hebard Guns, Peoria, Illinois.

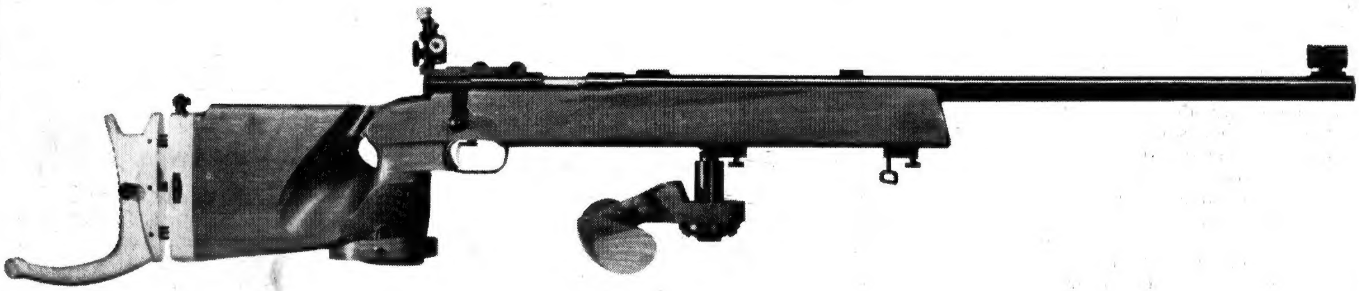
Random Shots

By Betty Summerall Duncan

It's true, shooters in the U. S. get short-changed in the fame department! But, not so in Tokyo during the XVIII Olympiad, where the population of Japan not only knew the "players without a program," but accorded them deferential treatment akin to hero worship. Everywhere they went they were called by name and besieged for autographs—not that they complained about it, you understand. It must have been gratifying to at last receive recognition on a par with the elite of the more lucrative spectator sports.

(Continued on Page Twelve)

We don't say you can win an Olympic medal if you use an Anschutz



But all the winners in Tokyo did

The Anschutz Match 54 was used by all the smallbore rifle medal winners in the 1964 Olympics.

In the 120 shot, 3 position match, the Anschutz was used by the American gold medal winner to set both a new world record and a new Olympic record (1164 points).

The Anschutz was used by the Bulgarian silver medal winner to beat the old Olympic record.

The Anschutz was used by the Hungarian bronze medal winner to beat the old Olympic record.

That's not all.

In the 60 shot prone match, the Anschutz Match 54 was used by the Hungarian gold medal winner to set both a new world record and a new Olympic record (597 points).

The Anschutz was used by the American silver medal winner to beat the old world and Olympic records.

The Anschutz was used by the American bronze medal winner to beat the old world and Olympic records.

And even that's not all.

In the 1964 National Matches at Camp Perry, the Anschutz Match 54 was used to win both the National Smallbore Rifle Prone championship (4792-379X); and the National Smallbore Rifle Position championship, (1555-74X).

Made in West Germany, the Anschutz Match 54 smallbore target rifle is brought to American and Canadian shooters exclusively by Savage and sold only by retail sporting arms dealers.

You can own a target rifle made by Anschutz at prices ranging from less than $80 to over $300.

No one knows better than we do that the shooter—not his equipment—wins matches. Outstanding ability, constant practice and dedicated effort produced these record-breaking achievements. In selecting Anschutz rifles, these great competitors simply assured themselves of equipment that was equal to their high level of performance.

Savage
ANSCHUTZ

For free, full-color catalog, write Savage Arms, Westfield 10, Massachusetts.
Prices subject to change. Slightly higher in Canada.

INTERNAL BALLISTICS—I

Edward M. Yard

Experimental Ballistics Associates

Newton's Laws of Motion explain the relation of force to mass and change of velocity of matter in our universe. Bullets are matter. Their velocity is changed from nothing before firing to a large value at the muzzle. A very great force is needed to cause this. Earlier discussion in this series has introduced these ideas, along with a sample of application.

BULLETS (like any material object) are changed in their existing motions only by a force. Newton tells us this, and also that the force needed increases as the mass of the object and with the rate of change of velocity. This is not an unreasonably complex study, but it did lead to the introduction of calculus to deal with such problems. It is the calculus that finds for us the formulas that apply. We will keep you free of a dependence upon this slightly higher math as much as possible.

The equation that states the relation of force and mass is:

Force=Mass X Acceleration

For those to whom these terms may not be entirely clear, force is a push or pull, and in our work will be measured in pounds. Mass is the resistance an object has to being moved. In our world when we weigh an object the result in pounds is Mass X Gravity. Gravity, of course is an acceleration, and is tending to move all objects. This is why a force, measured in pounds, is needed to prevent things from moving in a gravity field,—why when you put something on a scale it moves to read the pounds needed to oppose the acceleration of gravity,—why when we relax our grip on anything it falls quickly to the floor. We are so used to this happening, everyone accepts it without always remembering why:

F=MA (Gravity is acceleration—A)

This basic equation will be used often in your internal ballistic study. Before passing on, we'd like to rewrite simply to avoid later confusion of symbols (A is commonly used for area), and as usually stated, it is:

F= ma (Force=mass X acceleration)

These ideas about motion of objects made clear by Newton lead to other equations we will need, and involve the use of his calculus to derive them. Those who do not follow the operation of calculus should not be dismayed, as it is used only to convert ideas and concepts to useful form, and such operations may be accepted as more valid than any other relation of ideas that you know of, just as correct as 1+1=2.

If we start with the concept that distance moved equals speed (velocity) multiplied by time of travel, stated as:

$s = Vt$

Differentiating $\frac{ds}{dt} = V$

Differentiate again, and $\frac{d^2s}{dt^2} = \frac{dV}{dt}$

$\frac{dV}{dt}$ is defined as acceleration. The symbols read: the rate of change of velocity with respect to time. This is the same as acceleration. And so:

$\frac{dV}{dt} = a$

Integrating $V = at$

Substitute $V = \frac{ds}{dt}$

$\frac{ds}{dt} = at$

Integrating $s = \frac{1}{2}at^2$

by substitution $V^2 = 2as$

The formulas that will help us later then, are:

(1) $F = ma$
(2) $s = Vt$
(3) $V = at$
(4) $s = \frac{1}{2}at^2$
(5) $V^2 = 2as$

(For those with calculus)

$\frac{ds}{dt} = V$, $\frac{d^2s}{d\,t^2} = \frac{dV}{dt} = a$

so $\frac{ds}{dt} = at$

DON'T PUT DOWN the book! These formulas are to help you. They spell out the relations between velocity, time, distance, acceleration, force and mass that determine exactly what happens to our bullets from primer flash to muzzle flash. There is no way to by-pass this stuff and understand. But only those five (1 to 5) equations at the left above need be used to practice. (That to the right is for those who follow how we work out the others).

This is the mechanics of Newton, and no credit to us, only to Sir Isaac, and it is as solid as the rock of Gibraltar. It may not always be easy to find the way to use these ideas to help us with our ballistics. They are, nonetheless, those most basic to our study. We've already seen some use of them.

WHY DOES THAT BULLET GO

Let's start with (3) above, V=at.

It says that velocity equals acceleration multiplied by time. Acceleration is a push, and the longer the push the faster you go. If you've pushed a kid in a swing, you know. That's the way of it: longer push, higher velocity. And long barrels WILL give you more speed on the ball.

Articles often cite some nominal loss of velocity per inch of barrel lopped off, sometimes even suggesting that handloads will make up for this. But it is true that no matter how you may try, barrel length means time, and velocity goes up just as long as there is enough powder gas push. For most cartridges a longer barrel than standard will yield higher muzzle velocity. In the large capacity cases this is especially true. The larger the ratio of charge weight to bullet weight, the greater is the advantage of a long barrel. Eventually friction will slow the bullet, and there are ways to estimate when. Usually those big case jobs are short barreled, their muzzle flash imitating a welder with a big rod.

IF IT'S Push that makes the bullet pop, let's look at (1) and the most basic equation: F=ma

Some ideas from this relation we'll pick up later, but it tells us that mass has a direct effect upon Force. And these add up (actually they multiply up) to a required force, and this we should know is pressure (the force is the result of pressure).

The heavier the bullet and the higher its velocity the greater the force (pressure) needed to get it there. The required force for any particular bullet and velocity may be calculated, usually in the form of mean effective pressure, abbreviated as M. E. P, It is the **average** pressure needed to meet the desired velocity, and it does not take into account friction of the bore.

The previous section of these monographs gave an example of an M. E. P. calculation using equations (1) and (5) and F=PA, where A is bore area. Because this can be a helpful value in studying small arms loads, let's discuss the method briefly. Equation (5) is used to figure the acceleration, a, necessary.

$V^2 = 2as$, solve for a, $a = V^2/2s$ in feet per sec.^{2}

V is the bullet velocity desired, F.p.s., and s is the barrel length used in **feet**

Note that the longer the barrel in feet, the smaller a will be, leading to a lower pressure requirement in the next step.

(1) may be used to figure the force, substituting the value of a above, and the mass of the bullet. The relation of mass to weight has been explained in an earlier paragraph. Bullet weight in grains divided by 225,120 (constant) is bullet mass. F=PA says that any force may be generated by a pressure, P, acting on the bore area, A in **square feet.** So, by dividing force, F, by the area of your bore, the result is M. E. P.

Maximum pressure and M. E. P. are only partially dependent. A high value of mean pressure usually means a high Pmax, the factor being about 3, but it could be much higher. Conversely a high max pressure is no assurance of a good value of M. E. P.

In the last installment we cited an example of using energy figures in developing loads, and finished with a note not to draw conclusions until reading future numbers in this series.

Watch Facts

In giving that example we used some information, commonly believed, that isn't so. On top of that, we used a powder energy value that had an arithmetic error in it. Curiously, the result is the same as actual performance of the load. And, in untangling the snarls, we learned a few unexpected things.

H240 powder is not the same as 2400. While it has been used somewhat interchangeably, and thought to be a bit faster burning lot, it isn't. Next 2400 does not yield 2500 B. t. u./lb., nor does H240 have the same heating value (which we had assumed). 2400 gives 2060 B. t. u./lb. (with arithmetic corrected), H240 goes 1950 B. t. u. per pound.

Since the 160 grain Speer bullet does chronograph 2100 F. p. s. in the little .357 Magnum Martini Cadet from a 20" barrel (yes, all those figures and values have been checked and double checked), recalculating that H240 load shows:

$$\frac{17 \times 1950}{7000} \times 778 = 3680 \text{ Ft. Lbs.}$$

Muzzle Energy $= \frac{1}{2}mV^2$, 1570 Ft. Lbs.

Efficiency is 42.65% as compared to the 4227 load at 33.4%. And this requires a different explanation than we thought before. Then it seemed that the greater energy of H240 had accounted for the higher bullet velocity by sustaining pressure longer. We can't now assume this.

Noting the bore of our .357 rifle when firing 4227, there were not the signs of unburned powder usually associated with a too slow propellant. However, a one third increase in efficiency of converting powder energy to bullet energy in the same gun with the same other components but a faster powder can mean only a more complete burn up of H240 compared to 4227.

The fact that our bores are not strewn with log-like chunks of bleached nitrocellulose means that grains burned down to dust size, but may still have carried an appreciable fraction of powder energy with them past the muzzle.

Noting that most gun efficiencies are lower than this, and 30% being a good ball park figure, the indication is that many popular charges do not really burn up before the bullet skips the muzzle. They burn enough so that only a dust remains, and this has been cheerfully called fouling, lumping it with ash, primer remains, and metal bits. Had both of these powders burned completely, results would have been similar, since no magic curve of gas expansion could account for major variation.

(Next Page)

The idea that many of our most used powder charges may not burn completely before the bullet clears the bore may be a novel one, but we'll see more reason to believe it as we proceed. In view of the pressures and temperatures usual to gun loads, much higher efficiencies than are normally shown could be expected.

Having had a look at powder energy and how it can affect the results of a load, we should soon be getting to some more data about powders themselves. This is scarce. A good bit of what we have has had to be tested by ourselves, on a comparative basis. Having run most of the popular powders through the bomb calorimeter, we now have their comparative heat contents. This data will be presented in condensed form in a future chapter. The full tabulation may be had on request.

(**Editor's note of correction:** There is a printing error in the article "INTERNAL BALLISTICS—O," December 1964, pages 8 and 9.

The use of V2 in the formulas on page 9 is **incorrect.** That should be used as V squared, **NOT** V multiplied by 2.)

HEAT TREATMENT AND AGE-HARDENING OF BULLET ALLOYS

A. J. Hammer

Part II. Heat Treatment and Age-Hardening of Some Common Bullet Alloys

In the first article in this series it was shown that an alloy containing 2.5% antimony and 97.5% lead could be hardened by a simple heating-quenching-aging process to give an alloy with a Brinell hardness greater than that of linotype metal. James V. King had mentioned that bullets cast from common bullet alloys could be hardened by a similar type of treatment **(1)**. (Numbers in parentheses refer to references listed in the bibliography at the end of this article.)

The experiments described in this article were done to determine the increase in hardness that may be obtained by subjecting a few of the commonly used bullet alloys to a heating-quenching-aging process. Because it is known that lead alloys which contain antimony undergo a change in hardness with age, it was decided to include a series of hardness measurements on the alloys over an extended period of time which would show any change in hardness both after heat treatment and as cast in the usual manner, without any treatment.

One of the things that sometimes leads to confusion on the part of the hand loader is the description of the alloys recommended in some reloading handbooks and articles on handloading which have appeared in various magazines. The words "soft," "medium" and "hard" as used in these descriptions of bullet alloys leaves considerable doubt in the mind of the handloader who is attempting to duplicate a recommended load. When the composition of the alloy is given, the handloader is able to come close to duplicating the recommended load but, as will be shown later in this article, there may be considerable difference in the hardness of two bullets cast from the same alloy, if one of them has been allowed to age for an extended period of time.

For most precise work, uniformity of bullet hardness should be considered as well as uniformity of bullet weights, powder charges and the other components and operations that go into the loading of match-quality ammunition.

This writer has found the following purely arbitrary general purpose classification of bullet alloys to be helpful. The soft alloys, ranging from Brinell number 6 to 9 include those alloys which are suitable for revolver loads. The medium hard alloys, falling between Brinell number 10 and 18 are suitable for casting bullets for semi-automatic pistols, such as the .45 Colt A. C. P. and the Colt Super Conversion, while the hard alloys with Brinell numbers between 19 and 30 are suitable for the higher velocity rifle bullets.

The reader will probably observe several inconsistencies in the above classification. Some shooters recommend "hard" bullets for the .45 A. C. P. while Al Dinan (2) obtained the smallest groups in his maching-rest testing of .45 A. C. P. handloads with an alloy which falls in the "soft" classification and some rifle shooters have had excellent success with alloys which would be considered "soft."

There is considerable variation in both composition and hardness of the alloys used by the top pistol shooters (3). Of the nine Pistol Champions who contributed information on their handloads to the American Rifleman, six alloys in the Brinell hardness range of 14.7 to 17 were being used, four alloys in the range 22 to 26 and one of approximately Brinell number 10 were also listed. Four antimony-lead alloys, one tin-lead alloy and six antimony-tin-lead alloys were listed. This suggests that the medium-to-hard alloys are proving most satisfactory for both revolver and semi-automatic pistol ammunition.

In order to determine the extent to which several popular bullet alloys can be hardened by a heating-quenching-aging process, cylinders of several alloys were heated in the temperature range of 421-439°F. for 72 hours, quenched in water at room temperature and the hardness of the alloy cylinders measured at intervals over an extended period of time. A duplicate set of cylinders of each alloy was prepared and their hardness measured at intervals to determine any change in hardness due to age-hardening of the untreated alloys.

The alloy specimens used in the experiments were cast in a mold designed to cast cylinders ¾" long and ¾" in diameter. When cast of pure lead, the cylinders weighed 941 grains. After casting, the bottom end of each cylinder was faced on a lathe and then polished to remove tool marks. Polishing was done on a piece of plate glass using No. 400 abrasive powder and water. The sprew ends of the cylinders were stamped with an alloy number and a cylinder number.

The method of measuring the Brinell Hardness of bullet alloys which has been described by Col. Harrison (4) was used in measuring the hardness of the cylinders. This method is based upon the measurement of the diameters of impressions produced in the unknown alloy and a standard reference metal or alloy of known hardness. Pressure is exerted on the two cylinders, with their polished ends separated by a steel ball, by placing them between the jaws of a vice. The depth to which the steel ball is forced into the polished surfaces depends on the relative hardnesses of the two cylinders, the ball penetrating farther into the softer cylinder, thus making a circular impression which is larger in diameter than the impression in the harder cylinder.

Substituting the measured diameters of the two impressions in the following formula and performing the necessary arithmetic, gives the Brinell hardness of the unknown alloy:

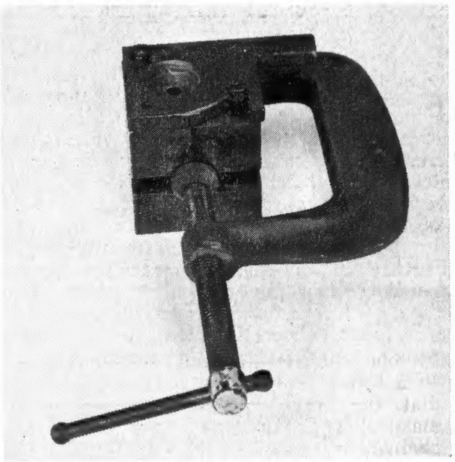
$$\left(\frac{D_2}{D_1}\right)^2 \text{ x } (\text{B.N. of standard}) = (\text{B.N. of unknown alloy})$$

where D_2 = diameter of impression in standard

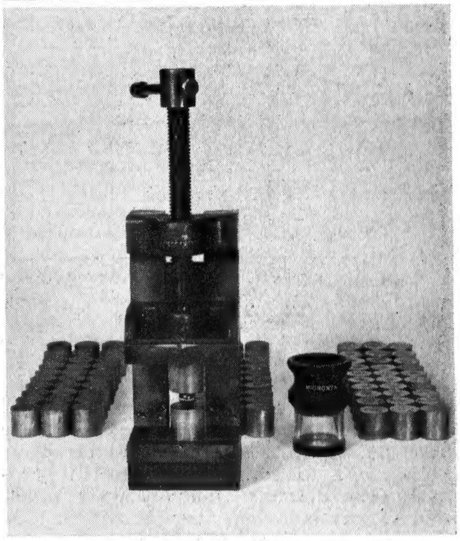
D_1 = diameter of impression in unknown

B.N. = Brinell hardness number

Preliminary experiments had shown that when pure lead (The pure lead used in these experiments is known to the trade as corroding lead and conforms to A. S. T. M. Specification B29-55. This grade of lead contains a maximum of 0.06% impurities.) was used as the reference standard, the impressions were frequently not circular in shape. This made it difficult to accurately measure the diameters of the impressions. It was also found that when impressions were made in pure lead cylinders, they sometimes expanded enough to cause an appreciable error in the measurement of the diameter of the impression. An alloy somewhat harder than pure lead was found to be a better reference standard for use in these experiments because the impressions formed during the hardness measurements were circular in practically every case.



Assembled mold for casting test cylinders. The C clamp serves as the handle.



Forming impressions in unknown alloy and standard alloy with 0.375" ball. Diameters of impressions were measured with the Micronta magnifying scale.

The standard alloy contained approximately 5% tin and 95% lead. It was prepared from Grade A Ingot lead and non-antimonial solder containing 50% lead and 50% tin which conforms to A. S. T. M. Standard Specification B-32-31. Both the lead and solder were obtained from the National Lead Company.

The hardness of the standard alloy was determined using pure lead cylinders as the standard for comparison. The Lead Industries Association (5) gives 4.3 as the Brinell hardness of pure cast lead, as found by the National Bureau of Standards. This value was used in calculating the hardness of the tin-lead alloy standard.

A number of measurements of the hardness of the tin-lead standard alloy were made using balls of different diameters. It was found that a 0.375" ball gave the most consistent impressions when a pressure exerted by rotating the screw of the vice through 180° was used.

(Continued on Page Six)

Heat Treatment

(Continued from Page Five)

Using the value of 4.3 as the Brinell hardness of the pure lead cylinders, the average of a number of hardness measurements on the tin-lead reference alloy gave a value of 8.6. The hardness of this reference alloy was checked by Homer S. Powley using his direct method of measuring Birnell hardness (6) and found to be 8.5.

The following are the results of the heat-treating and age hardening experiments on four popular bullet alloys. One alloy of low antimony and tin content is included to show the effect of heat-treatment and age-hardening on an alloy of this composition.

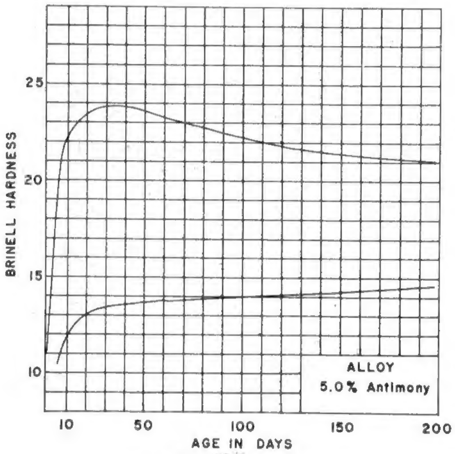


Fig. 6 Alloy 5A
Upper curve, heat-treated alloy
Lower curve, untreated alloy

Alloy 5A.

This alloy contains 5% antimony and the balance lead. It is a popular binary alloy among pistol shooters and compares with the 1 to 10 tin-lead alloy in hardness. The untreated alloy shows a rather rapid increase in hardness for the first 30 days of aging, after which the alloy continues to increase in hardness but at a more rapid rate than the 1-1-18 alloy. (Fig. 6). Although the alloy contains a rather high per cent of antimony, the peak of the age-hardness curve for the heat-treated alloy occurred at about 35 days with an increase in hardness of about 10.3 Brinell numbers over the untreated alloy.

One undesirable feature of this alloy after heat-treatment is its rather rapid loss of hardness during aging. Comparing the four alloys used in these experiments, the 1-1-18 alloy lost hardness on aging less rapidly than the others while the 5A alloy lost hardness most rapidly.

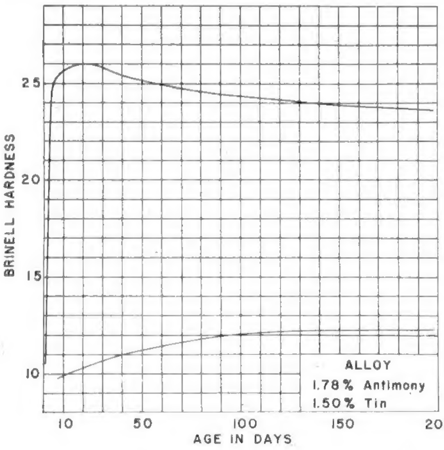


Fig. 7 Alloy 600
Upper curve, heat treated alloy
Lower curve, untreated alloy

Alloy 600.

This alloy was an accumulation of metal from bullet traps, scrap metal and metal recovered from dross. No attempt was made to control its composition as it was to be used mainly as a source of lead in making up harder alloys. After thorough mixing, a sample showed the following composition from chemical analysis:

Antimony	1.78%
Tin	1.50
Copper	0.03
Lead	Balance

The alloy was identified with the number 600 because there were approximately 600 pounds in the entire lot.

Gonser (7) has described a process for treatment of an alloy of similar composition in which he was able to increase the hardness from Brinell number 9 to over 21 by a simple heat-treatment process. His alloy contained 2% antimony and 1% tin.

Figure 7 shows the effect of heating Alloy 600 at 421-439°F. for 72 hours, followed by quenching in water at room temperature. After aging for 200 days, this alloy still had a hardness greater than that of linotype metal.

The small amount of copper in this alloy probably contributed to the large increase in hardness of this alloy after heat treatment. Copper is known to increase the solubility of antimony in lead, even when present in amounts less than 0.1% (9).

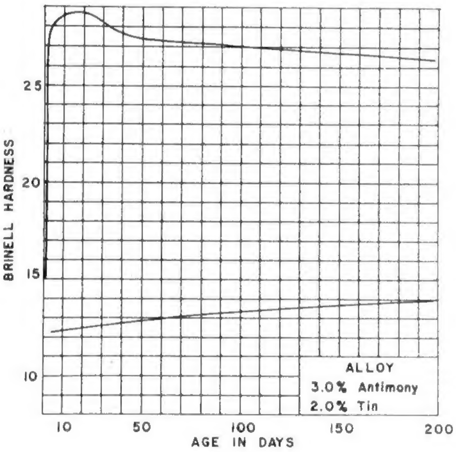


Fig. 8 Alloy 3A2T
Upper curve, heat treated alloy
Lower curve, untreated alloy

Alloy 3A2T.

This alloy contained 3% antimony and 2% tin with the balance lead. It is one of the better alloys for casting both revolver and pistol bullets as it has a hardness of between 12 and 14 on the Brinell scale. It has the advantage of sufficient antimony content to account for the major amount of hardness, plus 2% tin which, in addition to contributing to the hardness, also improves the casting properties of the alloy.

In a letter to The Hand-Gpunner (8), G. Elliott Murphy of the Accuracy Bullet Company, describes the use of this alloy in their Perfcast bullets.

The age-hardness curve (Fig. 8) for the heat-treated alloy shows a very rapid increase in hardness during the first few days of aging, reaching a peak in about 11 days. This alloy also showed a Brinell hardness number greater than that of linotype metal after aging for 200 days.

The age-hardness curve for the untreated alloy is almost a straight line for the time covered by the experiment. Continuation of this line would probably give a rather close approximation to the hardness of this alloy after aging for longer periods of time.

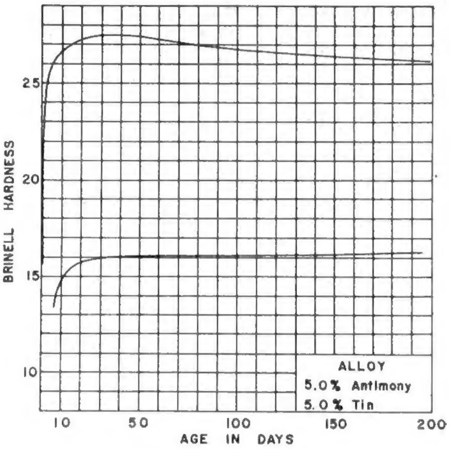


Fig. 9 Alloy 1-1-18
Upper curve, heat treated alloy
Lower curve, untreated alloy

Alloy 1-1-18.

This is one of the popular alloys for casting bullets for the .45 A. C. P. and .38 Super conversions. No information is available to this writer concerning its use in the S. & W. .38 Model 52, but from its performance in the Colt guns, there is little doubt that it will perform equally well in the S. & W. Model 52.

It contains 5% antimony, 5% tin and the balance lead. It has a Brinell hardness of about 16 which places it in the medium hard classification. Like the 3A2T alloy, it contains antimony which accounts for the major amount of hardness, plus tin which in addition to contributing to the hardness, improves the casting qualities of the alloy.

Hardened bullets of this alloy have given good results in the .30-'06 Springfield rifle.

As cast, this alloy shows a rapid increase in hardness on age-hardening for the first 30 days and then a gradual increase in hardness as age-hardening continues (Fig. 9). This is somewhat different from the age-hardening characteristics of Alloy 3A2T which shows a gradual increase in hardness over the aging period shown in Figure 8. After heating and quenching, this alloy shows a rapid increase in hardness, reaching maximum hardness in about 30 days, after which the hardness gradually decreases.

Lead—Tin Alloys.

Alloys containing only tin and lead are not as susceptible to hardening by heat-treatment or by age-hardening as the antimony-lead and the antimony-tin-lead alloys. The maximum increase in hardness treatment, is said to occur in an alloy containing 14.5% tin and 85.5% lead (9), which of a tin-lead alloy, resulting from heat is beyond the practical limit of tin content of bullet alloys.

An untreated alloy containing one part of tin to 20 parts of lead showed a variation of only 0.2 Brinell number when aged for 254 days. The same alloy after heat-treatment, quenching and aging for the same period of time, showed a variation of about 0.6 Brinell number.

An untreated alloy containing one part of tin to ten parts of lead had a hardness of 11.4 seven days after casting but after aging for 254 days, the hardness had decreased to 8.8. The same alloy after heat treatment, quenching and aging had a Brinell hardness of 15.5 after aging one day, but the hardness had decreased to 10.3 after 255 days.

The test cylinders used in these experiments were ¾" long and ¾" in diameter and weighed 941 grains when cast of pure lead. Because the hardness obtained during the heating-quenching-aging process depends, among other things, on the rate of cooling of the alloy during quenching, it was thought that bullets might show a difference in hardness from the test cylinders of the same alloy when treated in the same manner, due to the difference in the rates of cooling.

Test cylinders and several types of bullets were cast from Alloy 2.5A (2.5% antimony, 97.5% lead) and treated by a modification of the method used by Dean and Hudson (**10**) in that a lower temperature was used during the heat-treatment. Since Harrison's method of measuring Brinell hardness is not as suitable for measuring the hardness of small objects as the method described by Homer Powley (**6**), samples of bullets and test cylinders were sent to Mr. Powley for hardness measurements. A Brinell hardness of 15.4 had been obtained for the heat-treated Alloy 2.5A test cylinder by Harrison's method. The following are the Brinell hardness numbers of the Alloy 2.5A test cylinder and several bullets of the same composition as found by the direct method of Mr. Powley:

Sample	**Brinell Number**
Alloy 2.5A test cylinder	15.1
Bullet, H. & G. .38 No. 50BB	12.7
Bullet, Lyman .45 No. 45266	12.7
Bullet, .38 swaged	12.7

The swaged bullets were made by casting cores in the Lyman Core casting mold, swaging the bullets in the C-H Swag-O-Matic press and then subjecting them to the same treatment as the other bullets and test cylinders.

These bullets and test cylinders had been aged for 201 days at the time the hardness value of 15.4 had been obtained by Harrison's method. The test cylinders had not shown a measurable change in hardness for 21 days. The Brinell numbers obtained by Mr. Powley were obtained after 207 days of aging so any difference in hardness due to a few more days of aging was negligible.

In all of the alloys used in these experiments, it was observed that alloys containing antimony, either the antimony-lead or the antimony-tin-lead alloys showed an increase in hardness with age. Although hardness measurements were made over a period of 200 days for most of the alloys, the time of one of the alloys was extended to 400 days and a measurable increase in hardness from the 200 to the 400 day aging period was observed.

All of these alloys, after heat-treatment and quenching, showed a rapid increase in hardness, the maximum of which was reached in from 15 to 35 days, depending on the composition of the alloy. After the maximum hardness was reached, there was a gradual decrease in hardness over the period covered by the experiments, the rate of hardness decrease also varying with the composition of the alloy.

One can only speculate about the hardness of these alloys after being allowed to age for longer periods of time. From the trend of the age-hardness curves, one would assume that the hardness of the untreated alloys would continue to increase and the hardness of the treated alloys would continue to decrease until the two age-hardness curves coincided.

This gradual change in the hardness of bullet alloys suggests that a record should be kept of the date of casting each lot of bullets. One lot of bullets fired on the range after only a few days of aging would not be expected to have the same hardness as bullets cast from the same alloy and allowed to age for six months or longer.

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BOYDSTON DEFEATS GRATER IN TRIPLE CREEDMOOR AT FALL ROUND-UP

By Betty Summerall Duncan

***

Certainly the most evenly matched pair of shooters in the history of rifle tournaments contributed their share toward making the Los Angeles Rifle & Revolver Club's annual **Pacific States Fall Round-Up Smallbore Rifle Prone Tournament** on Nov. 7-8 a memorable one. (The challenge period is open on the above statement). With **Bob Boydston** and **Bill Grater** deadlocked in all three aggregates and Herb Hollister becoming a co-holder of his own National Record, the shoot was not lacking in excitement.

Yet, it was not a cut-throat type of competition. On the contrary, too much complacency and good fellowship precluded any flashy shooting. After it was all over, Grater was saying, "I think you have another X coming, Bob. You ought to challenge. And, if you challenge, I'll challenge my score." This they both did in the midst of our photo-snapping, which we accomplished without knowing the identity of the winner, but in the meantime, our sub-aggregate winners had escaped.

Challenges left the picture unchanged and the Pacific States Fall Round-Up title went to **Bob Boydston** for his 3191-226X Creedmoor over Bill Grater. Boydston's Montana wind-doping experience gave him the edge in all three aggregates where he excelled at the longer range.

Tournament sponsors who wonder why we had 167 entries with 158 actual competitors, just check the dates on the calendar. The entire nation, regardless of party, was seething with tension following the November 3rd elections. For a shooter ,the most complete release is competition which necessitates erasing all other factors from his concentration.

Figuring the odds, it is never safe to do so on the West Coast without counting **Bob Perkins** in. Although it has been 12 years since he was National Champion, the "Fresno Flash" has merely mellowed and settled down with the passage of time. He obviously has not lost his doping knowledge nor his ability to win. He was "concentrating so hard" on the tricky wind conditions which confronted the second relay in the first match that he "shot a possible and didn't know it," when all the other Masters were in trouble to varying degrees. Expert Richard Hansen, Sr., of West Covina, Calif., accounted for the only other Dewar Course 400. After

(Continued on Page Eight)

Ask L. G. Rackel, 1964 Wimbledon Winner,* about Sierra Bullets . . .

"Your **Matchkings** were very good to me each time I squeezed the trigger of the .300 H & H magnum rifle in the 1964 National Match 1000 yd. Wimbledon Cup and Leech Cup competitions . . . A possible 100 with 13 V's in the Wimbledon got me into that shoot-off. In the first shoot-off I compiled a score of 50 and 9 V's. The shot-by-shot shoot-off lasted for 9 rounds in which I took 8 V's and one five. This adds up to **79 Matchkings fired for record at 1000 yards, all of which were in the bulls eye. Of this total 59 went through the V-ring."**

*

This world famous 1000 yd. contest has been won by riflemen using Sierra Bullets in the last 11 out of 12 matches.

Mr. Rackel used Sierra's 190 gr. Match-king H.P. (one of four 30 cal. Matchking Bullets).

SIERRA BULLETS

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Boydston Defeats Grater

(Continued from Page Seven)

staking his claim to the Metallic Sight Aggregate, Perkins proceeded to insure that he did not lose it.

There is a note of pathos surrounding that victory, for Bob Perkins was subconsciously paying his final tribute to an old friend, well-known gunsmith **Henry C. Wright,** who built his rifle. His condition was critical, we knew, but what we did not know was that Henry had "gone to sleep in his big chair" the previous day.

Always a serious threat, Henry Benson did a very fine job of wind-doping to win the 100-yd. iron with 399-30X. John Hughes, Boydston, Hollister, Perkins, and Grater dropped a couple each. Knowing that when Grater fails to clean his rifle he invariably drops a couple of low ones, we were speculating when we heard that he dumped them out the side . . . That match badly crippled quite a few aggregates. The treachery of the wind currents was in the subtle switches in angle. Too many inexperienced shooters ignore the wind at the firing point and rely entirely on dope from range flags. Contributing to the bewilderment in this instance, however, was the erratic behavior of the changes in angle. Detecting a switch in a 9 o'clock wind to one coming in from 7 o'clock, it might be expected on this range that the shot would go toward 11 o'clock. But, not this time! It landed in the 9-ring at either 5 o'clock or 2 o'clock, or even 8 o'clock. Conditions were full of surprises.

The 50-meter was Grater's match as he scored the only possible—400-26X. Stidworthy, Bill Stephens, and Creed Page lost 1 each.

CWO Lyle Hassen, of the 3rd Marine Air Wing Rifle Team, an Expert, took the 50-yd. with the only 400, X-count 25. The four 399-30X scores provoked something of an explosion. Innocently copying the scores for the newspapers, I remarked more to myself than to anyone present that there was an error in the application of the Creedmoor system. A veteran Master shooter from another area immediately disputed me and declared that they always broke ties in that manner—that is, they considered only the numerical score on each bull in reverse order, and only if the tie was not broken in this manner would X's be considered on the next go-round. The Referee and another prominent out-of-town shooter got into the act in opposition to my stand. Far be it from me to pretend that I am infallible, but when the Creedmoor System is involved, well—I studied it for three years, while working to have the co-holdership of the 100-yd. any sight National Record recognized for a young shooter, and as a result, Rule 17.6 was included in the 1962 rule book, declaring co-holder status when National Records are equalled . . . There appears to be a widespread failure to understand Rule 15.5, mainly because many, including some referees, do not bother to read the rule in its entirety. Tournaments have been won and lost on the basis of an erroneous interpretation of the rule. For this reason, I feel it important to discuss it in detail. May I suggest that any competitor who does not have a current rule book, which he has carefully studied, is missing part of his equipment. What good does it do to win if someone else gets the glory because you are not familiar enough with the rules to stand up for your rights? Wait for the '65 rule book; it could contain something interesting . . . To set the record straight—for matches fired at one range, one position, when competitors have the same numerical score with the same number of X's, beginning with the last numbered bull, check the numerical score, then the **number of X's.** If they are identical, apply this method for each numbered bull in reverse order from last to first, until the tie is broken . . .I would like to add that the confusion was correctly resolved by the stat office and the 1st, 2nd, and 3rd Master awards went to Tom Whitaker, Sharon Stagers, and Tom Guerin, respectively.

Four famous Precision Shooters (all P. S. readers) following Pacific States Fall Round-Up Tournament, holding miscellaneous awards as Grand Aggregate had not yet been determined. (L. to R.) Grand Aggregate winner Bob Boydston, who Creedmoored Bill Grater. Herb Hollister, who placed third, teamed with Henry Benson, who won the 50-yd. Any, to equal his own National 2-man team record at 50-meters Any. Photo by Carl Knight.

Metallic Aggregate:	
Perkins	1594-104X
Boydston	1593- 99X
Grater	1593- 99X
Benson, Salmon, Idaho	1592-108X
George Stidworthy, Prescott, Ariz.	1591-108X
Herb Hollister, Boulder, Colo.	1591-106X
High Junior	
Tom Whitaker, Norco, Calif.	1590- 97X
High Lady	
Sharon Stagers, Canoga Park, Calif.	1588-102X

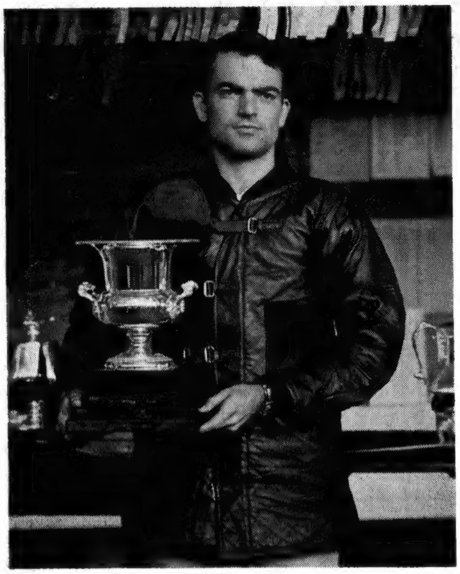
There was a bit of suspense in the Expert class as we waited to learn whether father or son was the winner. Richard Hansen, Sr., was as proud as could be when his son, Richard, Jr., out-X'd him—1586-86X to 1586-79X. John Boone, Arcadia, Calif. led the SS-MK Class with 1574-69X.

When Herb Hollister and Ray Steele established the 800-67X National Record for the 50-meter any some years ago, they expected it to stand for quite a while, which it has. By a strange quirk of fate, Herb teamed up with Henry Benson over the same course of fire and scores 400-35X as he coached Henry into a 400-32X, which equalled the 800-67X Record. Surely this is a "first"—for a Record holder to become his own co-holder . . . Junior shooter Tom Whitaker and Larry Anderson, just out of junior ranks, won the Master Class medals with their 799-58X . . . The Navy claimed a new National Service Record as National Service Rifle Champion, EOCS Daniel F. Morine, Jr., and AO-1 Charles R. Bover came through with 796-46X. Both are attached to the San Diego Naval Training Center . . . The Expert Class trophies went to Bueford Waddel and Fred Stebler for their 794-42X . . . Grater did manage to beat Boydston an X in the team match, which they fired together—399-32X to 399-31X. Just wonder, though, how much coaching and how much "Kentucky-ing" was going on.

Vic Auer, too long in the background, equalled his own National Reserve Record in winning the any sight Dewar with 400-37X. Hollister, with 36X's, figured, before the scores were posted, that he had shot well enough to scare a few people. He surely did . . . Possibles dwindled to three at 100-yds. as Stidworthy Creedmoored Hollister's 400-31X. Boydston's 400-30X was the other clea nscore. . . . The 50-meter, a booby-trap for some and a bonus for others, lost the tournament for both Hollister and Perkins. Auer's 400-34X led over Benson's 400-33X. Perkins' 37X and Stidworthy's 35X were exceedingly unrealistic with 2 points down . . . Henry Benson finished up with a flourish as his 400-37X wrapped up the 50-yd. Grater trailed with 400-35X, as several stumped their toes at the easy range, including Auer who still won the Any Sight Aggregate. Fifteen 400's, with only ten in the Master Class, seemed entirely too few. There should have been half a dozen or more 1600's.

Any Sight Aggregate	
Auer	1598-135X
Hollister	1598-132X
Boydston	1598-127X
Grater	1598-127X
Stidworthy	1597-129X
John Hughes, Scottsdale, Ariz.	1596-112X
Bill Stephens, Sacramento, Cal.	1596-112X
Perkins	1595-130X
Expert Class	
Peter Mattaino, Phoenix, Ariz.	1592- 94X
Kenneth Hayes, USMCR, Fresno	1591-106X
SS-MK Class	
Ivan Osmak, NTC, San Diego, Calif.	1585-99X

California State Champs, past and present, figured in the Grand Aggregate duel. Boydston, who held the state title in 1963, did not win an individual match or sub-aggregate; yet, he had the points where they counted . . . The situation is somewhat reminiscent of the 1960 Fall Round-Up when National Senior Champion (in 1960 and 1964) Herb Hollister



Tom Whitaker, holding the L. C. Davis Memorial Trophy, which he won for being High Junior at the Pacific States Fall Round-Up Smallbore Tournament. Photo by Carl Knight.

and the current National Smallbore Prone Champion, W/O Jim Hill, USMC, both compiled 3197-256X scores. It was on that occasion that Hollister had the points where they counted, as Hill lost all 3 points in the 100-yd. any. Hill made history the first day, Nov. 5th, 1960, by firing 2000 X 2000, including his team match score fired in a storm of gale proportions. Hill's 1600-132X was with Metallic Sights, so will someone please pass the aspirin to the NRA National Records section. The National Record for the Service Category is still listed at 1600-127X. (**Note:** We did not have all of the various categories 4 years ago, which explains why this record was not recognized at that time. It was actually broken on July 15, 1961 with 1600-137X, but for some reason the Zeppelin sponsors have still failed to report it, as the report has not reached NRA. I can prove that Jim Hill fired the above score on the above date; therefore, until such time as the **actual** National Service Record is recognized, the 1600-132X should be accepted as the record.)

Returning to the present tournament, let's take a look at the—

Grand Aggregate

Boydston—Fall Round-Up Champion	3191-226X
Grater	3191-226X
Hollister	3189-238X
Perkins	3189-234X
Stidworthy	3188-237X
Benson	3187-236X
Auer	3186-238X

Tom Whitaker, who shot at Camp Perry this year as a member of the Calif. State .30 caliber team, was awarded the L. C. Davis Memorial Trophy as high-scoring junior for his 3182-199X, which was 8th place overall. Four places behind him was High Lady, Sharon Stagers, with 3177-188X. Sharon, who fired the entire course with metallic sights, posted the only 400 on the 1964 Randle Trophy International Team. This was her final tournament as a junior.

Expert Class	
Paul Jessup, La Puente, Calif.	3174-181X
Richard Hansen, Jr.	3174-178X
Peter Mattaino	3171-182X
Harvey Brinson, Seal Beach, Calif.	3169-177X
Kenneth Hayes	3168-185X
SS-MK Class	
Harold Philpott, 3rd Marine Air Wing	3154-161X
Ivan Osmak	3146-166X
Ed Eichelkraut, La Habra, Calif.	3145-150X

For a comprehensive view of equipment used, let us begin with Boydston. He never could load from the shoulder with a bolt action (he isn't the only one), and this particular BSA-Mark II has a Kenyon barrel, Kenyon rear sight, Bell front, and he used Mark III ammo. His rifle scope is a prototype model of the new 10-30 variable power with 1⅝" clear aperture, developed by **L. D. De Simone** and **Paul Lewin,** of San Diego, which is attracting so much attention. In fact, they are being swamped with advance orders. One of the big attractions is that their scope isn't too heavy.

Grater used the same outfit with which he won the Western Nationals—California State Championship last April and with which you all should be familiar—the Atkinson-Marquart 52-C with Karl Kenyon trigger, Redfield X-tube with Int'l rear sight, Bell front sight, Lyman 20X scope and Mark III ammo.

About Bob Perkins' rifle—Henry Wright fitted a Hart barrel to the Wright action, installed a Wright-Allen trigger, stocked it, and endowed it with his own special magical quality. It shoots—as "Perky" has clearly shown. He still uses his right-handed Vaver rear sight with Barrett disc and Olympic front, Lyman 20X scope and Mark III.

Hollister fired an Anschutz with Anschutz receiver sight and Redfield Int'l front sights for 50-yds. and 100-yds., B & L scope, and an assortment of Mark III, EZXS, and Remington . . . Henry Benson shot his famed "white rifle" with irons but switched to his "blue rifle" for scope. Both 52-C actions have Kenyon barrels, sweated in with solder by Kenyon, and equipped with Kenyon triggers. Karl Kenyon made his first trigger for Hank Benson. The first Kenyon action was for its creator, but the second was a gift to his good friend, Benson, which is engraved on the sight. Henry used a modified Bell front sight, B & L scope, and Remington ammo . . . Auer fired his reconditioned 52C in laminated stock with Swem bedder, Unertl scope at 24 power; a broken Redfield X-tube held on with rubber band, Int'l rear sight with 3-clicks backlash (that was discovered much later), with perfectly good Bell front sight. His ammo was the usual mixture of lots.

Even though the competitors seemed to reflect the mood of the nation and needed to relax, they seemed to enjoy themselves. The 12 o'clock Masters all shot subnormal scores, but it was a good tournament.

BROOKLYN, NEW YORK, 100 YARD INDOOR

The first of the Metropolitan Rifle League's 100 yard indoor smallbore rifle matches for the 1964-65 season was fired at the II Corps Armory in Brooklyn on November 29th with a total of 65 shooters.

The course consisted of two 40-shot prone matches with any sights and an aggregate for the two matches.

Those shooting 400 possible scores in the first match were: F. Cole 400-30x, F. Egner, Jr. 400-30x, A. Rosenblatt 400-29x, J. Lantelme 400-28x, M. Coughlin 400-28x, and F. Addeo 400-26x.

The five high in the second match were: R .Triggs 400-33, A. Battisto 400-32x, L. Norton 400-31x, M. Coughlin 400-30x, and W. Heil 400-30x. Also shooting 400 scores were Barbara Norton, F. Boelke, R. Leslie, J. Maher, and R. Alvis.

M. Coughlin was the only one to shoot an 800 possible aggregate score, with 53 X's. Following him were L. Lantelme 799-63x, A. Rosenblatt 799-62x, Barbara Norton 799-59x and A. Battisto 799-57x.

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56 grains 4350 Vel. 2874 fps
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.567"

30 CAL. 168 GR. B.T.
52 grains 4350 Vel. 2692 fps
Rifle: 30-06 Remington 40X Custom
.442"

30 CAL. 180 GR. S.P.
76 grains H-450 Vel. 2772 fps
Rifle: .300 Weatherby Magnum
.442"

338 CAL. 225 GR. S.P.
80 grains 4350 Vel. 2859 fps
Rifle: 340 Weatherby Magnum
.340"

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22 CAL. 55 GR. S.P.
42 grains 4350 Vel. 3678 fps
Rifle: 220 Swift Win. M70
.634"

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PRESIDENT'S CORNER

Fellow Members:

In this, my first communication to you in my capacity as president of the National Bench Rest Shooters Association, Inc., I want to make two points very clear. First, I am extremely grateful for the honor which has been conferred upon me by the directors of the NBRSA in electing me president for 1965. Second, I promise that I will do everything in my power to help the healthy growth of this organization.

It is my firm belief that to keep this promise I must try very hard to maintain the delicate balance between the rights of individual members, shooters and affiliated clubs and the overall interests of the NBRSA. I am sure that each of you recognizes your corresponding responsibility to each other and the NBRSA as a whole. As in all good human relations, it is basically a matter of reasonable give and take.

As of Dec. 1, 1964, we had more than 800 members. Varmint and Sporter Class competition has shown marked increases. It appears that competition in the Unrestricted Class has not shown corresponding increases and, in fact, may be suffering a decline. I do not feel that we have sufficient evidence yet to determine whether these are indications of long-range trends and I do not feel that we can make any sound judgment at this time as to whether a decline in Unrestricted Class competition should require us to make any changes in our rules or our basic attitudes toward benchrest shooting.

It would seem, however, that any means by which we can attract more serious, dedicated shooters to our organization should be encouraged. Although our treasury is just about holding its own, it appears obvious that improvements in our financial status would enable the NBRSA to expand the scope of its activity and services to its members. Furthermore, it is readily apparent that the easiest and most efficient way to improve our financial condition is to increase our membership. This is basically the job of each of the present members. Will each of you sign up a new member?

The NBRSA has much to offer all serious shooters and the new annual dues of $6 are a small price for membership and the subscription to Precision Shooting. These points should be remembered when we are talking with fellow varmint and target shooters. Additional information for prospective members is available without cost from our Secretary, Mrs. Bernice McMullen.

In line with increasing the membership, many have felt that the Varmint and Sporter Class competition has been responsible for bringing in many new members. If this is true, it would seem that we must capitalize on it. Fortunately, we can exploit the value of light rifle competition without jeopardizing the heavy rifle competitors.

Presumably, this was one of the basic reasons underlying the adoption of the Kingsley Rule at the 1964 Annual Meeting in Tulsa regarding barrel dimensions for Varmint and Sporter Class rifles. It was felt by a substantial majority of the directors and officers present that the Kingsley Rule liberalized the restrictions so that more shooters could compete in these classes without requiring expensive changes in rifles they own at present.

Several members, however, have expressed the belief that the Kingsley Rule actually does just the opposite. Several have urged strongly that the rule be revoked and that the former restriction of .900 of an inch diameter at the muzzle for any length of barrel be restored. Some members have coupled this request with the argument that NBRSA rules have been changed hastily without the benefit of practical experience to determine whether it was really necessary or desirable to change the rule. There may be considerable merit to this criticism.

In view of this, it is my conviction that the rules adopted by proper vote of the 1964 Annual Meeting should not be tampered with during the 1965 shooting season. I believe that our rules should have stability and that we should test new rules for at least a full season to determine whether they impose hardships or handicaps on individual shooters or threaten the general good of NBRSA.

It appears that some of the opposition to the newly-adopted rule on barrel dimensions for Varmint and Sporter Class rifles may be based upon misinformation or misunderstanding. For example, some of the letters which have been written suggest that the writers did not take into consideration two other rules which affect design and dimensions of varmint and sporter rifles. One of these is the 13½-pound weight limit on Heavy Varmint Class rifles and the 10½-pound limit on Light Varmint and Sporter Class rifles. As L. E. (Sam) Wilson pointed out in the December issue of PS, the maximum application of the Kingsley Rule would give a competitor the advantage of no more than four additional ounces of barrel weight.

There has been no conclusive proof that four additional ounces of weight in the barrel provides an advantage over the same weight distributed in other components of the rifle; for example, in the stock, action or scope mounts. We may be able to find out this year. And, if it is proven that this small amount of extra barrel weight assures a decided advantage, then we can do something about it.

Also, as a practical matter, many shooters feel that sufficient barrel length to permit complete powder combustion and maximum velocity is more desirable and important for accuracy than the small amount of extra barrel stiffness which could be obtained with a shorter, thicker barrel.

It must be made clear that the new barrel dimension rule will not bar any varmint or sporter rifle which was legal under any prior rule.

Some of the letters written by shooters who oppose the new rule contained statements which actually support it. One member, for example, pointed out that rifles with the lighter barrels required under the old rule were capable of shooting record groups. He questioned the advisability of changing the rule to permit greater barrel thickness at shorter lengths. The inference is that the rule was changed only to allow shorter, thicker barrels for extra barrel stiffness.

This, however, was not the intent of the officers and directors who approved the new rule. The basic purpose for the change was to permit the average member to shorten his barrel without requiring a costly re-chambering or barrel re-turning job. It was clearly the intent of the officers and directors to make it possible for more persons, not fewer, to shoot in the Varmint and Sporter Classes.

A summary of other rule changes approved at the 1964 Annual Meeting will be given in the next issue of P. S. Surely, not all of these changes will meet the approval of all members. But, as I stated at the beginning of this message, let's approach these problems with a sportsmanlike spirit of give and take.

Cordially yours,
Brunon V. Boroszewski

CANTON, OHIO, VARMINT MATCH

The Canton-McKinley Rifle Club held its last match for the 1964 season on November 7th and 8th with 18 shooters competing. The match was for Varmint class rifles and 5-shot matches at 200 yards range.

The high ranking aggregates were:

	Score	M.O.A.
Shock	250-20x	.5582
Anderson	250-18x	.5628
Newton	250-17x	.6605
Rucker	250-17x	.6997
Mangon	250-15x	.5847

Mangon, from New Philadelphia, Ohio, was shooting this match for the first time, and shot his fine score with a borrowed gun. Third ranking Newton does his fine shootin gusing a 10X Weaver scope. Winner Shock's rifle is a 6mm International caliber. Weather is reported to have been fairly good with just ordinary winds to contend with.

NOTICE TO MEMBERS OF EASTERN REGION NBRSA

The annual winter meeting of the Eastern Region, National Bench Rest Shooters Association, will be held at the Midtown Tower Hotel, Rochester, New York, on January 23rd and 24th, 1965. The Saturday morning session will start at 9:00 A. M.

The change of the location and choice was the result of a thorough study by a committee of Ed Seymour, Sig Gucfa and your present Director. We invite all of you to attend. The better the turnout the better a job we can do. Lets get out and show Doc Garcelon, our new Director-elect, that we're with him all the way.

Hotel reservations may be made direct with the hotel. This is a beautiful location and for the benefit of the ladies; the hotel is part of an indoor mall shopping area.

Members who plan to attend the meetings are requested to immediately arrange their reservation requirements with their Deputy Director. The Deputy Directors are: Gerald Arnold, R. D. 2, Gillett, Pa., Phone, Bently Creek, 717—LY6-4085; and George E. Kelbly, 4 N. Hickin Ave., Rittman, Ohio, Phone Area Code 216 925-1501.

Dr. A. H. Garcelon
Director, Eastern Region
133 State Street
Augusta, Maine

AN ANNOUNCEMENT

NBRSA President Brunon V. Boroszewski announced this month that the Advisory Committee of Former Presidents has been re-activated to assist in administration of the organization. The Committee was revived by action of the officers and directors at the 1964 Annual Meeting in Tulsa.

President Boroszewski said all former NBRSA presidents are being asked to participate and "give us the benefit of their experience and judgment on specific problems." The President said that one of the major questions being referred to the Advisory Committee is the problem of how to speed-up the measuring and validation of possible record targets.

NEW BENCH REST RECORDS OFFICIALLY RECOGNIZED

The following Unrestricted Rifle Class records were all shot at a registered match sponsored by the Chippewa Rifle Club on their Easton, Ohio range, **July 20th and 21st, 1963.**

"Open Rests" class: An aggregate of five 5-shot matches at 200 yards (.3869 MOA) and five 5-shot matches at 300 meters (.6573 MOA), two range aggregate of .5221 MOA. (There is no previous aggregate record for this course.) The record was made by Ernest C. Scafuri of Detroit, Michigan, with a .222 Rem. caliber in Hart barrel on a sleeved Remington action with Unertl scope. The load was 24.5 grs. Ball powder, his own 51 gr. bullets made in Culver dies and Rem. 6½ primers. Rifle was gunsmithed by G. Dick and stocked by Brown.

"Open Rests" class: An aggregate of five 10-shot groups at 300 meters of .8489 MOA. Also an aggregate of five 10-shot matches at 200 yards (.7103 MOA) and five 10-shot matches at 300 meters for a two-range aggregate of .7796 MOA. (Both are new aggregate courses.) These record aggregates were shot by George C. Clarke, Jr. of Leesburg, Virginia with a .30 cal. in Hart barrel with 1 in 12" twist on Hart action with Unertl 20X scope. Load was 48 grs. H380, Sierra 168 gr. bullets and Winchester primers. Rifle was gunsmithed by Bob Hart and stocked by Stinehour.

"Open Rests" class: An aggregate of five 5-shot groups at 300 meters of .6295 MOA. (A new aggregate course—no previous record.) This aggregate was shot by E. L. "Gene" Beecher from Cleveland Heights, Ohio, with a .222 Magnum caliber in Douglas barrel on Remington action with Lyman 25X scope. Load was 26 grs. Ball-C powder, 51½ gr. hand-made bullets and RWS primers., Rifle was gunsmithed by Frost and stocked by Brown.

"Limited Rests" class: An aggregate of five 10-shot groups at 200 yards (.5605 MOA) and five 10-shot groups at 300 meters (.8600 MOA) for two-range aggregate of .7103 MOA. (A new aggregate course—no previous record.) This aggregate was shot by Brunon V. Boroszewski from Orchard Park, New York, with a 308 caliber in Day barrel with 1 in 16" twist on Remington 722 action with B&L 6X24 scope. Load was 45.5 grs. 4895 powder, 147.5 gr. bullets made in B&A dies and Federal 215 primers. Rifle was gunsmithed and stocked by the shooter.

"Limited Rests" class: An aggregate of five 10-shot groups at 300 meters of .8302 MOA. (New course—no previous record.) The aggregate was shot by George E. Kelbly from Rittman, Ohio, with a .308 Win. caliber in Douglas barrel with 1 in 14" twist on Mauser action with Unertl 24X scope. Load was 46 grs. 4320 powder, 147 gr. bullets made in B&A dies and CCI Mag. primers. Kelbly did his own gunsmithing and stocking.

"Limited Rests" class: An aggregate of five 5-shot groups at 300 meters of .5949 MOA. Also an aggregate of five 5-shot groups at 200 yards and five 5-shot groups at 300 meters for two-range aggregate of 4845 MOA. (Both records are for new courses with no previous records.) These aggregates were shot by Paul O. Gottschall from Salem, Ohio, with a .222½ caliber in Hart barrel on FN Mauser action with Unertl 24X scope. Load was 21.8 grs. 4198 powder, 53 gr. bullets made in B&A dies and Remington 6½ primers. Gottschall did his own gunsmithing and stocking.

1964 Sporter and Varmint Records

Sporter Class: An aggregate of five 5-shot matches at 100 yards of .3695 MOA. The aggregate was shot by Dave Hall from Warsaw, New York, at the South Creek Rod & Gun Club range in Fassett, Pa. on July 12, 1964. He shot a 6X47 caliber in Hart barrel on Shilen action with Lyman 15X scope. Load was 23.5 grs. 4198 powder, Detsch 70 gr. bullets, Remington primers. Hall stocked his own rifle which was gunsmithed by Shilen.

Heavy Varmint Class: An aggregate of five 5-shot matches at 100 yards of .2189 MOA. Aggregate was shot by Lynn Hunt from Rock Stream, New York, at the South Creek Rod & Gun Club range in Fassett, Pa. on July 12, 1964. He shot a .222 caliber in Hart barrel on Shilen action with Unertl 20X scope. Load was 24 grs. Ball-C2 powder, 50 gr. bullets made in B&A dies and Federal primers. Rifle was gunsmithed by Sherman and stocked by Shilen.

Heavy Varmint Class: An aggregate of five 5-shot matches at 200 yards of .3054 MOA. The aggregate was shot by Thomas E. Gillman from Hot Springs, Arkansas, at Tulsa, Oklahoma on July 18, 1964. He shot his own 22 Tomcat caliber in Hart barrel on Gillman action with Unertl 20X scope. Load was 28.5 grs. of 4320 powder, 53 gr. Sierra bullets and Remington primers. Gillman did his own gunsmithing and stocking.

Light Varmint Class: A 5-shot group at 100 yards measuring .1629 inch. The group was shot by J. D. Richardson from Abilene, Texas, at the West Texas Sportsman Club range in Abilene, Texas on August 6, 1964. He shot a .222 Rem. caliber in Douglas barrel on Sako action with Unertl 20X scope. Load was 23.3 grs. Ball-C powder, Sisk 55 gr. bullets and Remington primers. Rifle was gunsmithed by Davis and stocked by Richardson.

REGARDING A SHOOTING RULE AND EXCERPTS FROM MEMBERS' LETTERS

(Prepared by George Wyatt and approved by NBRSA President Brunon V. Boroszewski.)

A storm of controversy has arisen over changes in the barrel restrictions for Varmint and Sporter Class rifles. The restrictions adopted by the NBRSA directors and officers at the Annual Meeting in September restores the previous rule which pegged muzzle diameter at .900 of an inch on a 28-inch barrel.

The rule was vigorously debated at the Annual Meeting and Arthur M. Freund of St. Louis, director-elect of the Mississippi Valley Region, spearheaded the opposition to any change in the dimension rules contained in the 1962 and 1964 rule books.

The 1962 and 1964 rule books specified that the muzzle diameter of Varmint and Sporter Class rifles must be .900 of an inch regardless of the length of the barrel. Considerable opposition to this rule had developed, however, since it appeared to impose extra difficulty and expense on those shooters who desired to shorten barrels on existing guns.

Strictly interpreted, the 1962 and 1964 rule required that the barrel either must be shortened from the breech—which required re-chambering—or that the entire barrel be re-turned on a lathe to bring it down to the .900 muzzle diameter if it were shortened at the muzzle. It was felt that both of these operations were costly and could not be accomplished by the shooter at home unless he had a lathe and other expensive machine tools.

In 1962, Charles Kingsley of Port Washington, N. Y., a lawyer and veteran benchrest shooter, was appointed chairman of a committee assigned to re-codify the NBRSA rule book. Among other rules revisions, the committee recommended that the barrel dimensions for Varmint and Sporter Class rifles be restricted to .900 of an inch at 28 inches ahead of the receiver ring with a maximum diameter of 1.250 inches for four inches ahead of the receiver ring. The proposed rule stipulated that the barrel diameter could not exceed a straight taper from 1.250 inches at a point four inches ahead of the receiver ring to .900 of an inch at a point 28 inches ahead of the receiver ring.

In effect, this rule made it possible for a barrel to be shortened at the muzzle—an operation which could be performed by most shooters in their own homes with a hacksaw, file and hand-drill.

This rule change was adopted by a proper vote of the NBRSA officers and Board of Directors to take effect in 1963. Vigorous protests were made in the 1963 season, however, over the rule change. As a result of these protests, the officers and directors voted at the 1963 Annual Meeting to restore the previous rule for the 1964 season.

The issue was brought up again at the mid-winter meeting of the Eastern Region last January in Elmira, N. Y. After considerable discussion the Eastern Region members at the meeting voted unanimously to instruct their director and deputy directors to take action at the 1964 NBRSA Annual Meeting at Tulsa, Okla., to return to the so-called Kingsley Rule which pegged barrel dimensions at a muzzle diameter of .900 of an inch at 28 inches from the receiver ring.

(Continued on Page Twelve)

Regarding a Shooting Rule

(Continued from Page Eleven)

The Eastern Region director, Brunon V. Boroszewski, and Deputy Directors Alonzo H. (Doc) Garcelon and George E. Kelbly followed the mandate of the Eastern Region's mid-winter meeting and urged adoption of the Kingsley Rule at Tulsa. The matter was debated at length and, after all views had been expressed, the Kingsley Rule was re-adopted by a vote of six to two. Eastern Region Director Boroszewski abstained from voting because he was chairing the meeting in the absence of President Alfred W. Walter who had been called away by the illness of his mother.

The Annual Meeting had barely ended when rumbles of discontent began to be heard over the rule change applying to barrel dimensions for Varmint and Sporter Class rifles. In the weeks since then, these rumbles have grown to major proportions with objections being expressed in a virtual deluge of letters to President Walter and other directors. The protests, however, appear to be centered in the Mississippi Valley, Gulf Coast and Mid-continent Regions with a few coming from other regions.

A number of these letters were published in the December issue of Precision Shooting. Several others were passed on to PS by President Walter to be included in the January issue. Newly-elected President Boroszewski, who assumed office on Jan. 1, 1965, reviewed these letters as part of the responsibility of his office.

In view of the large amount of space which would be required to publish these letters in full, President Boroszewski recommended that this article be written to summarize the controversy and to present pertinent extracts from the letters. The President reserved comment on the letters for presentation in his official statement published in this issue in the "President's Corner" column.

Here are extracts and a summary of the members' letters:

John R. Bushnell of Golden City, Mo., in a letter to President Walter, expressed opposition to the so-called "new rule" and urged that the former rule of .900 at the muzzle of any length barrel be restored. He wrote: "With the new ruling a barrel 26 inches long could measure .929. This means a difference of only .0145 thickness in the barrel at the muzzle. What's to gain by this small amount?"

Frederick G. Hall of Vestal, N. Y., wrote that he had become "interested in the NBRSA varmint class competition because the class restricts the shooter to use a reasonable 'field gun'; not a freak baby bench rest stubby." He proposed that the "new rule effective Jan. 1, 1965 be revoked."

Grant B. Pickard of Grand Prairie, Texas, charged that many rifles had been "voted obsolete" by adoption of the rule change. He wrote: "I know they say this change does not affect the rifles that are now in use, neither do the rules by NRA for military rifles affect the Krag, but how many Krags do you see at Camp Perry?" Pickard also noted that the rule in effect in 1964 had "allowed the building of varmint rifles capable of extreme . . record of .1923 will prove." He added: "This is no longer a shooting game It is just an equipment race that I feel accuracy as the setting of a new 200-yard will leave many shooters and prospective shooters so far behind that they will drop out before they get started.

John D. Richardson of Abilene, Texas, writing as treasurer of the West Texas Sportsman Club, reported that the Varmint and Sporter Classes "have established a strong toe hold in Texas and the Gulf Coast Region." He went on: "We feel that one big reason is the fact that a person may invest his money in a precision-built rifle by one of the local gunsmiths under the current muzzle specifications and still have a rifle that he can truthfully call a varmint or sporter rifle as it stands in the rack." "To sacrifice this with the instigation of short, baby bull barrels that can only serve one purpose, and without question do a good job for which they were built, in our opinion will seriously handicap future interest and growth in the Varmint and Sporter Classes."

General objections to adoption of the so-called new rule were registered in letters from L. C. (Kit) Puett of Lakeport, Calif.; W. L. Farrar of Grand Prairie, Texas; Harold E. Campau of Southgate, Mich.; and Harold R. Broughton of Big Spring, Texas.

A letter written by L. E. (Red) Cornelison of Seminole, Okla., to L. F. (Bud) Carden of Kansas City, reports on an informal survey Cornelison took at Carden's request. Carden is the director of the Mid-continent Region.

Cornelison reported that Bob Berry of Pawnee, Okla.; A. L. Day, Ed Garrott and Charles Neumann of Tulsa; Horace Powers of Okmulgee, Okla.; Larry Beard and Mike Cruse of Fayetteville, Ark. are "indifferent to the new rule." But he added that they said that "if it will harm the club in any way, would rather leave the rule as it is now or .900 limit on muzzle."

Cornelison went on to report that A. W. Ham, Jack Morgan, Clyne Davis, Nolan Rammage, H. F. Simpson, Pat Patterson, Lloyd Bottoms and Hugh Cornelison of Seminole, Okla.; J. D. Hale of Tulsa; W. D. Conrey, Ed Spencer and Charles Williams of Dallas, Texas; Art Teague, Bob Morgan and Jim Saylors, all of Wewoka, Okla. "are all against the proposed new rule and are definitely for leaving it at .900 muzzle limit."

Cornelison added that "The boys in Dallas, Texas, have a membership of over 200 . . . and feel that the club as a whole is against the proposed new rule. Also the T. I. Club of Dallas is against it." He went on to state that in his own opinion, "it would be a harmful rule and really of no benefit to the club as a whole and I too am against the proposed new rule."

In a letter to new President Boroszewski, outgoing President Walter reported that he had received a telephone call from J. L. (Pokey) Bonner, new director of the Gulf Coast Region. Walter quoted Bonner as stating: "If the new varmint and sporter barrel law went into effect, practically all the group in the Gulf Region would not hold registered matches, but will shoot under the 1964 rule."

Walter went on to report that letters he has been receiving from Mid-continent, Mississippi Valley and North Central Regions "are all against it (the so-called new rule)."

IT WASN'T THE POWDER

Dear Phil:

I read with a great deal of amusement your comments in the December issue of Precision Shooting regarding H-380 powder and its usefulness in the .222 Magnum cartridge. You said, "The 13th shooter of H-380 used it in a .222 Magnum. His accuracy results at Tulsa would not tend to recommend H-380 as a desirable powder for the .222 Mag. case." FAR BE IT FROM SO!!! The accuracy results of this Idaho country boy was purely the fault of the guy behind the trigger, not H-380. Consequently I must hasten to the defense of a powder which serves me faithfully all year until Tulsa. In fact, in truth, I only loaded H-380 the first day. My first day's aggregate was poor enough that I succumbed to the advice of one of my favorite shooting pals and switched to Ball C-I the last three days. With, incidentally, no improvement. Unfortunately, after having made the change I should have changed my equipment card, but, failed to do so.

In further defense of the powder I should point out to you that I used it in two previous matches, the California State Championships at Richmond and at the West Coast Championships in Yreka, the week prior Tulsa. In the California State Matches it won the grand agg. in the Limited rests with a .472. In the same matches with unrestricted rests, the same load resulted in a 200 yd. MOA of .468 and a 100 yd. agg. of .372. Later in the West Coast matches this load resulted in a 200 yard MOA of .421, which is a match and range record.

What happened at Tulsa is anyone's guess and believe me no one could be more interested than Wally Titus. The only observation I can make is that the gun shot poorly three times during the year. Twice at Seattle and in Tulsa. Both ranges have concrete top benches.

In view of the scores made with it at Richmond and Yreka, I can't find it within myself to blame the powder. I am confident that it was myself or my equipment.

Wally Titus
Lewiston, Idaho

Random Shots

(Continued from Page Two)

The first shooting results which trickled back from Tokyo were hidden away in an obscure spot in the newspapers. As the shooting medals began to accumulate, the commentators blinked hard and, in spite of themselves, were forced to admit that our four riflemen were headliners. And, on the day when **Lones Wigger** claimed the highest award for 3-positional smallbore, his was the lone gold medal for the U. S. That put shooting on the front page!

Between them, 1/Lt. LONES W. WIGGER, JR., USA; 2/Lt GARY L. ANDERSON, NGUS; Capt. TOMMY G. POOL, USA; and Sgt. MARTIN I. GUNNARSSON, USA, won 5 out of a possible 9 medals in the three rifle events. This adds up to 2 gold medals, 1 silver, 2 bronze, and 3 World Records. We could say that we are proud of them—which is true, but trite. We **cannot** say that their shooting surpassed everyone's wildest expectations. Our Olympic rifle team shot just the way we figured they would! The only surprise was that registered by those countries which had underestimated the U. S.

Firing the 300-meter in the wind, Anderson had a 92 his 1st 10-shots **kneeling.** After that he got the dope and went on for a 384. **Standing,** his 377 was a point over Hollenstein's World Record (although, I believe only aggregate scores are considered for records in the Olympics). His **prone** score was 392 . . . In breaking Hollenstein's 1150 World Record, Anderson's 1153 made him the unprecedented World Record holder of both the 300-meter and the 3-positional smallbore for a few days. He actually won his gold medal on the basis of his **standing** scores.

300-meters

1—1153—Gary Anderson, USA, gold medal
2—1144—Shota Kveliashvili, silver (Russia)
3—1136—Martin Gunnarsson, USA, bronze
4—1135—Alexander Gerasimenok (Russia)
5—1135—August Hollenstein (Switzerland)
6—1133—Einari Kervinen (Finland)

Gunnarsson, with 389 prone, 380 kneeling, and 367 standing had the 3rd high standing score . . . Kveliashvili exceeded the World mark with a 389 **kneel-**

ing . . . Best prone score was that of Gerasimenok, a 396 shot in late afternoon.

Next shooting event was the **smallbore prone**. Do you recall my mentioning a look of "cold determination" last month? It was **Lones Wigger** about whom I was speaking . . . It was rumored that there was a shoot-off for the gold medal. Such was not the case, as Hammerl of Hungary scored 100 on the last 10-shots, to Wigger's 99, the ISU version of our Creedmoor system.

Smallbore Prone
1—597—Lazlo Hammerl (Hungary), gold
2—597—Lones W. Wigger, Jr., USA, silver
3—596—Tommy Pool, USA, bronze
4—595—Gilmour S. Boa (Canada)
5—595—Nicholai Rotaru (Roumania)
6—594—Akihiro Rinzaki (Japan)
7—594—Karl Wenk (Germany)

Wigger attributes a large part of his victory to Jim Hill's Anschutz. He shimmed up the butt stock with cardboard to achieve a little snugger fit. As previously forecast, he fired R-50.

This was, perhaps, but a warm-up for the match which really mattered to him—the **3-positional smallbore.** His confidence should have been soaring, for after one of the famous Japanese baths, he shot an 1170 in practice . . . He fired his own Anschutz in this event, which was outfitted (at the factory) with a special heavy barrel and glass bedded in his free rifle stock. It, nevertheless, has the Behnay touch, for when the USA MTU gunsmith took a look at Wigger shooting it, he chopped 1" off the butt and built up the comb approximately ½". (Behnay also glass-bedded Hill's prone-stocked Anschutz).

With his father in the stands, "Wig" started out so well that if he hadn't run out of steam at the end of the standing, he would have boosted Anderson's 3-positional World Record **by more than 7 points.** As it was, he so outclassed the field that it might have been embarrassing to the other competitors had he shot any better—especially to those who could be relegated to Siberia.

This is how the competition looked—:

3-positional smallbore
1—1164—Lones W. Wigger, Jr., USA, gold
2—1152—Velitchko Christov (Bulgaria), silver
3—1151—Laszlo Hammerl (Hungary), bronze
4—1148—Harry Kocher (Germany)
5—1147—Jerry Nowicki (Poland)
6—1147—Tommy Pool, USA

Wigger's 394 was a remarkable **kneeling** total, 3 points over the World Record. His 398 **prone** equalled the World mark. His standing score was 372. On the 1st 20-shots in this position, he had a 94 and a 99. His last 20-shot string netted him but a 91 and 88, when the grind began to tell on him.

***

In **Free Pistol**, Capt. **Franklin Green**, USAF, placed second to Markainen of Finland, who had 560. Green won the silver medal with a 557 in drizzly conditions, and Yoshikawa of Japan was 3rd with 555.

Lt. **William C. Morris**, III, USA, got the bronze medal for **trap shooting** (or rather, clay pigeon) behind an Italian, Matterelli and a Russian named Senechev. 1st—198; 2nd—194; and 3rd, Morris—194. Bill came out second in a 3-way shoot-off with Senechev and Rossini, of Italy, who placed 4th with 194.

***

Now, our Olympic rifle champs are the first to give credit to that master craftsman behind the scenes, their gunsmith, M/Sgt. Raymond Behnay, USA (Ret.), who has given their weapons the "royal treatment" to assure their having the best possible equipment to win. In describing Gary Anderson's Hart-barreled Remington .308, Behnay states, "the 40X center fire action was fitted with a rebuilt ¼ ounce Remington set trigger. I made the stock out of a laminated block of wood according to the directions Anderson gave me. The stock was cast off to the left at the rear and had the 'toe' of the butt plate set ¾ inch away from his chest. Andy cants his weapon quite a bit and this was my answer to his problem. I also fitted an Anschutz butt plate upside down on the stock so as not to interfere with the ear muffs Andy wears. On the action, I fitted a new base which would take a new Anschutz rear sight (Same as on the super match)."

Ray Behnay has enjoyed building, tuning, and adding the magic touch to the U. S. Army Marksmanship Training Unit weapons since March 1958. He has traveled to Europe a number of times with the Int'l team and also to Cairo when Anderson stole most of the glory. Retired from the Army in August of this year, Behnay is performing the same job in a civilian capacity. The difference is that now his services are available to all "those who need help"—civilians as well as the Int'l champs. His address is: 5357 Baxley Way, Columbus, Georgia, 31907.

***

T/Sgt. Louis J. Willing, USAF, served as Armorer for the Olympic Team in Tokyo.

****

I. S. U. Notes—Some rather mysterious developments have transpired since I reported to you that the 1966 World Championships would be conducted in the USA. I was informed authoritatively that Congress had appropriated the sum of $6 million for the construction of a National International Range. Unfortunately, their abrupt about-face has not been explained. All I can tell you is that the '66 World Championships are now scheduled to be held in Wiesbaden, West Germany. It does seem regrettable that the richest nation in the world is unable to host the World Championships, especially after issuing the invitation to the nations of the world to compete, which had been accepted.

The controversy over the use of a "standard rifle" has been temporarily resolved by the inclusion of a separate standard rifle event at the 1966 World Championships. Let us hope that the sapient gentlemen who make the decisions continue this as a **separate** event. To define "standard rifle," the weight limit is about 11 lbs. or 5 kgs. Consider what its adoption would mean, particularly to the Latin American nations where it has been a struggle to acquire free-rifles with their exorbitant import fees. Further, speaking for this hemisphere, outlawing the free-rifle would prove most unpopular. This initial action by the ISU, therefore, has been received quite enthusiastically.

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"A spot on the **International Dewar Team** should be taken more seriously" is the consensus among the Dewar Team veterans with whom I have spoken recently. There is still much consternation that National Prone Champ **Jim Hill** failed to represent the U. S. in this traditional contest against our friends in Great Britain

(Continued on Page Fourteen)

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Random Shots

(Continued from Page Thirteen)

and Canada. They all feel that there is something wrong with the system of selecting this important team—just as in 1954 when National Champ **Alonzo B. Wood,** who placed second in the Metallic Aggregate, was ineligible to fire on the Dewar Team because of a ruling that members must have attended a regional, which he had not done. That situation proved a bit embarrassing and the requirement was promptly deleted for 1955.

There appears to be a misconception among some shooters that making the Dewar Team is a reward for shooting well in the Metallic Sight Aggregate and that the team match firing is something of a lark—an aftermath, to which they attach little importance. Perhaps it is because their knowledge of the history of the Dewar Team is a little sketchy that they do not realize that this team should be composed of the 20 very finest shooters in our country and that the firing of the match is an opportunity to prove that their selection was not a fluke. The English Dewar Team is selected carefully and is always representative; whereas, our National Champion dropped 8 points in 3 aggregates to 47 points dropped by one Dewar Team member. This is no reflection on the latter shooter, for he made the team fairly. The results of the present system are, however, provocation for the assertion, "I could pick 20 shooters any year who could beat the Dewar Team," which I have heard more than once.

Even though we had some really topnotch shooters on the 1964 Dewar Team, the fact remains that the British again defeated us. Obviously, they have a better system for selecting all of their better shooters than we. For some specific suggestions, we have consulted the Captain of the 1964 Dewar Team, **Al Wood,** who prefaced his recommendations by saying, "I was, of course, disappointed that such talent as Art Cook, Jim Hill, Tommy Pool, and several others were not eligible to fire. It was a shame to waste such talent. Briefly, the following recommendations for future improvement of the match were submitted to the NRA as part of my captain's report and have received favorable comment from Frank Wyman:

1. That individual coaches be assigned by the **team officials** instead of picked by the firing members. We had a couple of inexperienced shooter-coach teams this year. A good coach can save many points, particularly in bad weather. The team officials usually know the best talent available through long association at Perry.
2. That qualification for the team be on the total metallic sight scores (2400 points) rather than the shorter metallic aggregate (1600 points). I believe Jim Hill, etc., would certainly have made the team with this system. We should have the best talent available.
3. That a sheltered 20 point range be built near the 1000 yard butts specifically for this match. The British fire their match on a similar range. The weather, as you know, was pretty terrible this year.
4. That the Thursday individual matches be scheduled to permit the team officials a choice of morning or afternoon for the Dewar. You may recall the first relay containing the masters and experts went on the line at 6:20 a. m. this year. It would not have been possible to fire the Dewar before this relay."

Al is truly rearing his children as offspring of a former National Champion should be reared. He continued on a more personal note: "The national matches this year produced the same old thrill for me as in the many past. Both of our boys fired in the regular program and our daughter enjoyed the junior tyro school. I was, of course, particularly pleased that our oldest son Daniel, age 15, made the Dewar team." I was not aware before that Daniel was either only 15 or Al Wood's son. He is certainly following in the footsteps of his famous father.

NEW NORMA CHRONOGRAPH GIVES INSTANTANEOUS READINGS: Newest addition to Norma ballistics laboratory in Sweden is this multi-purpose chronograph (background). Time-consuming sight reading gauges and manual averaging of notes is eliminated by direct linkage with electronic calculating machine (foreground). Automatic print-out registers not only individual readings, but averages millisecond velocities for extended "strings" of shots. This latest in chronography innovations has wide functional versatility, covers broad range of ballistic measurements, assures customers of consistent performance characteristics in Norma ammunition and components.

Herb Hollister brought out a potent suggestion, which merits serious consideration—: that some arrangement be made whereby the British National target is fired on more than once a year. I can think of several possibilities to accomplish this . . . . I invite comment and discussion on strengthening the Dewar Team.

****

Chris Petersen announced, "We don't mind having **Pres Kendall** carry off our trophies, for we got the better end of the deal. We have Kendall's big bore rifle in exchange." Hurrying away from the Richmond range on October 25th, after winning the **California State International Championship,** the National Smallbore Position Champ forgot his rifle. No harm done, for the Yankee Californians are honest (this is such a big state that there is an "up north" and "down south" all within state boundaries).

Thirty-nine smallbore competitors bowed to Lt. **Dennis Dingman**, USA MTU, who came through the 50-meter 3-position with 396 prone, 377 kneeling, 364 standing, for an 1137 win, barely edging High Civilian **Gordon Taras**, who also scored 1137—394 prone, 387 kneeling, 356 standing.

In the Service category, Lt. **Donald Adams**, USA MTU (who recently married Leigh Baxter, one of Florida's top shooting stars), placed second with 1135, outranking Pres Kendall's 1135 . . . **Chris Petersen's** 1123 was good for second Civilian, as Fergus Ward, San Francisco, and Bob Nickerson, La Grange Park, Ill., trailed with 1094. High Lady Virginia Bailey was 5th civilian, scoring 1087. Among the juniors, Joe Dugan's 1079 led.

In view of the fact that dates for this tournament failed to appear in **The Rifleman,** they had a very good turn-out. For big bore there were 7 service and 17 civilians. I notice that our friend, Adalbert Tschirner fired both courses.

Firing at 200-yds. (on the reduced Int'l target), **Capt. Kendall** bore down to win with 196 prone, a very fine 196 kneeling, and 178 standing for a 570 total. This added up to a 1705 Aggregate, which gave him the Calif. State title.

Runner-up was T/Sgt. **Allan H. Hannon**, who starred for the Air Force scoring 568 for second place at 200-yds. and 1701 in the Agg. His best score was the high prone 199; kneeling—193; standing—176. Lt. **James Frazer**, USA MTU, ranked 3rd in the big bore with 566, as **Dingman** came in 3rd in the Agg., firing 1698. **Taras**, with a creditable 1693, led the non-service, as Petersen, with 1650, followed.

We are all grateful to **Jesse Grigg** for affording us the benefit of his experiments and well thought-out conclusions. As I mentioned in October when I requested that his December 1961 article on "Barrel Insulation for Sun and Wind" be reprinted—you'll find some answers here.

Jesse informs us that the original insulation is still on. An "inveterate experimenter," he still considers that covering the barrel is one of the best things that he ever did to a rifle.

BSD

Jesse, your "Position Error" is a masterpiece. Ed Caygle, among many others, is most enthusiastic about it. You gave us a great deal to digest and work on, for this is the cause of more wild shots than is generally realized. I am happy that it was "Random Shots" which "put into your head the notion of writing" about this universal problem.

After attending the '64 National Matches, Jesse declared: "I never before had as much hard luck at Perry as I had this year. Picking up ahead of a downpour I lost a watch which I had carried 55 years, got food poisoning one night, got a bulletin board disqualification in one match, but beat the rap with the gain of a point. In another match my sling broke, compelling me to get a spare from the car and string it on firing time; in another match my trigger refused to release before the firing time was far gone. Still I managed to get off all record shots in the prone aggregates, fired two 400's—one with iron, one with scope, picked up a piece of hardware and averaged 98.95% overall, which maybe wasn't too bad for the oldest shooter on the line." I'll say it wasn't! You have to really love shooting to take that much punishment, though, and keep going back for more.

Now, I have a request to make—: **please** pass the word around about Jesse's watch and let's try to recover it for him!!!

BARREL INSULATION FOR SUN AND WIND

By Jesse M. Grigg

(Continued from December)

The asbestos covering proved out so well that I am going to describe in detail my method of applying it. The needed materials are gasket shellac, Duco cement, sheet asbestos, aluminum foil, Rust-Oleum aluminum paint, and wrapping twine or coarse thread to hold the coverings in place while the adhesives set. To get the little of asbestos and foil that was needed, I had to buy in the neighborhood hardware store full rolls, total cost **$2.45**.

The thicknesses of the asbestos and aluminum foil were respectively .022" and .001". Allowing for lapping of the foil and for adhesives and paint it was estimated that the total thickness of the covering would come to a little under 1/32". Accordingly, to provide a suitable clearance in the stock groove, I enlarged the latter 1/32" from the forestock tip to the receiver junction.

Next was cut a piece of asbestos whose length equaled that of the barrel, and whose tapered width was such that the edges would just meet on the bottom of the barrel after all sight blocks had been removed. A thin coat of gasket shellac was applied to the barrel. Then the sheet was wrapped in place, and snugly held there with a winding of coarse thread in turns about half an inch apart, and in some places closer if this was necessary for a fit. After the shellac had dried the winding of thread was removed, leaving the asbestos tightly surrounding the barrel, with very little penetration of shellac.

Owing to its exceeding thinness, the aluminum foil could be applied only by wrapping as one would wrap with tape. Accordingly I opened out several feet of the roll and cut a number of strips about ½" wide and four feet long. Because the stuff was so fragile this seemed to be about the greatest length that could be handled conveniently.

To apply it in such short lengths required frequent splicing. This was done as the wrapping progressed, with Duco cement between the lapped ends, and a few turns of coarse thread or twine at the splices to hold during the short interval needed for the cement to dry.

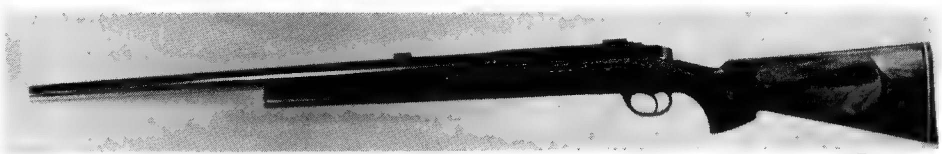
The next step was to cut out with a sharp knife for the sight blocks after the screw holes had been located with a scriber used as a prick punch. The resulting loose ends and edges were cemented in place with Duco, and held there with a few turns of twine until the cement had set.

Alone, the covering of aluminum foil was very fragile, in fact so much so that to grasp and lift the barrel with the hand would have displaced or torn it. To overcome this fault and still have a reflecting surface, Rust-Oleum paint was applied over the foil. The foil underneath prevented the paint from penetrating and destroying the insulating property of the asbestos. The paint on top worked in between the foil edges, leaving the layers cemented together, and providing a surface almost as hard and durable as if the paint had been applied directly to the barrel itself. To be sure I applied two coats, thus obtaining a covering which apparently can withstand any treatment excepting abuse.

For the first test I took the rifle, a Win. 52, into a tournament without knowing whether it would group or not, this when both the day and the occasion were ideal for resolving this important question. With a dazzling bright sun, and temperatures that reached 93° by mid-afternoon, the day was much too warm for personal comfort. Besides, occasional cross wind provided the cooling effect that was needed for the test. The course itself comprised two any sight meter matches, and of metallic sight matches one was a meter, the other a Dewar course. Moreover, in the air was a heat shimmer which made it impossible for me to call shots in the 10-rings at the longer ranges. Thus I had to sight in and try to stay in on the basis of nines. Notwithstanding all, my score for the day was 1592-104x.

(Continued on Page Seventeen)

SS&D RIFLES BY SHILEN



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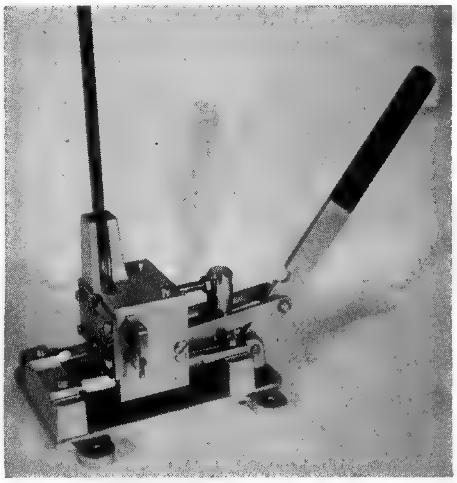

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THIS IS SS&D

By Ed Shilen

Fifteen months ago I closed down my shop in Dryden, New York (Shilen Rifles) and incorporated my business with Shooters Supply & Dewey, Inc. of Clinton Corners, New York. The time loss caused by moving the shop, getting the family settled into a new location, and then getting myself oriented to the new job and surroundings, ended up in my getting far behind in orders. And to make matters worse, three of us here at SS&D have had to spend time in the hospital and at home recuperating within the last year.

Needless to say, quite a few of my customers were rightfully disturbed because of the very late delivery I was making. One fellow from Michigan missed going to the Nationals because I didn't have his rifle finished in time. During this period of chaos correspondence was also neglected which didn't help matters at all. To show what a really fine bunch of people shooters are, not a single person was ever nasty or demanding. These fine people are the reason that there will always be custom gunsmiths. No one else would "put up" with us. I am glad to say that we are now caught up on the back orders and giving normal delivery; four to six weeks for actions and barreled actions, and three to four months for complete rifles.

At the few shoots that I was able to attend the past year, the question has always been, "Who, what, and where is SS&D?" SS&D is a Corporation consisting of John Dewey, Artie Shaw and myself. John Dewey formerly operated a retail store, barrel making shop, and custom gunsmithing shop in Roxbury, Connecticut. He is a typical conservative, meticulous New Englander, whose work is second to none. John is the actual "boss" at SS&D, has the responsibility of keeping the entire corporation running smoothly and gets stuck with the majority of the mountains of paper work involved.

Artie Shaw got bitten by the "gun bug" a few years ago and plunged head-long into bench rest shooting. It was through this interest in guns that he conceived the idea of SS&D and formed the present corporation. As he was unfamiliar with the retail gun business and gunsmithing, John Dewey was brought into the corporation to handle these departments. I was later added to the corporation to add my skills and products to the already extensive gunsmithing facilities of John Dewey. As it turned out, Art Shaw's other business commitments have demanded so much of his time that he has had to give up all shooting and is now inactive in the Corporation. Therefore, John Dewey now runs the retail and mail order departments, and I run the barrel making shop and custom gun shop. It would be impossible for just the two of us to run a business of this size so we naturally have hired help, and have been extremely fortunate in being able to find very experienced and capable personnel. George Dewey (John's son), because of his years of association with his father's gun business, plus the fact that he is an avid "gun bug" and hunter, is the fellow that you will most often see behind the counter at SS&D. In the retail department he is tops.

In the gun shop we have Vinnie Zolla who handles all the repair work, blueing and general gunsmithing. He is a graduate of the Colorado School of Gunsmithing, plus serving an apprenticeship with John Dewey. In the custom shop there are myself and two other fellows, Frank Tirrell and Paul Webb. Both of these fellows are former tool makers who really know their stuff. If it wasn't for the able capabilities of these fellows I would be "lost." Both of them are dyed-in-the-wool shooters and you will be seeing lots of them at the matches in coming years.

SS&D Gunshop. Paul Webb, right foreground; Frank Tirrell, left foreground; John Dewey, right background; Ed Shilen, left background.

Ed Shilen at the lapping and inspection bench at SS&D, air-gauging barrels. Bore-Scope on overhead rack.

We at SS&D are proud to announce that we intend to cater to the bench rest shooter. Not only with actions, barrels and rifles, but all the accessories and components needed in the game. We have just announced that we are now making our own Bench/Target grade stainless steel barrels. Barrel making is nothing new to John Dewey as he has been making barrels by the "cut" method for almost twenty years, BUT, he readily admits that the cut method just doesn't produce a barrel that will meet the demanding requirements of Bench Rest shooting. For this reason we have changed over and are now making barrels by our own "cold forming process," which combined with careful hand lapping produces a barrel that is extremely smooth and uniform. We have actually been making barrels by this process for quite a few months, but I "held off" announcing them to the bench rest shooters until I was absolutely sure that they were as good or better than any barrel now available. All barrels are internally measured with a Sheffield air gauge and must be uniform within .0001 inch from breech to muzzle. They are also given a visual internal inspection with a 6X Kollmorgen bore-scope and must be absolutely free of any tool marks, scratches, pits, etc. Only barrels which meet these demanding specifications are sold as Bench/Target grade barrels. Barrels are now available in calibers 22 rimfire, 22 center-fire, and 6mm. By January of 1965 we will also have 6.5mm, 7mm and 30 caliber. Besides fitting these barrels to our own action, we will also barrel any action supplied by the customer. Preturned blanks are available to gunsmiths.

Barrel Insulation for Sun and Wind

(Continued from Page Fifteen)

With a score like that on a day like that I felt as if I had cheated on my friends by coming on the line with an insulated barrel. Even so, I could not escape belief that this experiment was equal to the best of anything that I had ever done to a rifle. Nor was that opinion changed by anything that happened during the little of the hot season which yet remained. At present writing I believe that such a covering will be standard equipment on my outdoor rifles from now on.

However, I'd like to have, instead of foil over asbestos, a tightly-fitting, tapered metal sleeve. Maybe next year I'll try to make one of thin sheet metal with its butted edges underneath either brazed together or else secured with solder. If the attempt is successful I'll have the sheath chrome plated.

Bull-Session Stuff

SINGLE SHOT ACTIONS

I have read with interest the comments by Mr. Hallberg in the November issue of Precision Shooting. As the owner of several Farquharson and Henry actions I should like to offer some suggestions concerning a single shot action for the varmint shooter.

Most of the true Farquharson actions will withstand the pressures generated by the rimmed cartridges at present on the market. The actions are hammerless, extremely strong, and are well made. I have never seen a sloppy action based on the Farquharson principle. The action suffers several disadvantages however. The first is that it is built for rimmed cartridges, and while the extractor can be modified for rimless cartridges, this is not an easy matter. Second, the tangs are very long, and the attachment of the lower tang to the action leaves the attachment of the action to the stock rather weak. This is exemplified by the fact that the large actions chambered for such shells as the .577 Nitro Express X 3" often have Selous steel side plates fitted to strengthen the grip and reduce the risk of a fracture at this point due to heavy recoil. Third, the fore end is attached to the barrel, and as such detracts from accuracy. It should not be impossible to modify the action somewhat like the BSA Mk III target rifle so that the fore end is supported by the action, rather than by the barrel. Fourth, the hammer falls a considerable distance, and lock time should be shortened. Points in favor of this action are its strength, the shortness of the action, the lack of exposed firing pin, and the excellent workmanship seen in most models.

The Henry actions (and I refer to the hammer actions rather than the copies of the Farquharson which landed Alex. Henry in a losing law suit), have many similarities to the Farquharson. However, they do have an exposed firing pin, and have less locking surface than the corresponding size of Farquharson action. The fore end is attached to the barrel, but the extractor is easier to modify to rimless cartridge. The grip is the point of weakness, again because the manner of attaching the tangs to the rifle is not the best. Both actions are relatively simple, and have few moving parts, yet both require expert hand fitting, and would be difficult to produce in small numbers (eg for varmint shooters) at reasonable prices. I would venture to suggest that a shooter could get an excellent Farquharson second hand far cheaper than he would get a new action from Smith and Wesson. This is not to imply that Smith and Wesson could not build the action (they obviously can); it is to imply that the cost of tooling for such a project would make the price of the finished article prohibitive, unless many thousands of actions were sold. I would venture to suggest that one of the European arms companies could produce the item cheaper, purely because of the differential in wages paid to skilled machinists.

Why bother with the Farquharson and Henry actions? Why not resurrect the Winchester HiWall and LoWall? True, they are hammer rifles, with all the dangers of an exposed pin. However, a pin of the Neidner pattern should take care of most of the problems generated by a pierced primer. My hammer Henrys chambered for the 450X3¼ Nitro Express are presently being loaded as hot as the 458 Win. Magnum (530 gr. bullet. 83 gr. 4831), and these have exposed hammers and pins. No trouble has been experienced with these loads.

The trouble with most of the single shot actions now available is that they were designed in the late 1800's when exposed hammers and pins were de rigeur and when cartridges were not loaded to the pressures which they are now. Accuracy by modern standards was not good, and so fixation of fore end and stock to the action was not conducive to good shooting.

It should not be beyond the capabilities of any of the arms manufacturers to produce a single shot falling block hammerless action with short lock time, capable of handling rimmed and rimless shells in the 52,000 psi class, and yet cheap enough to be within the reach of the pockets of most single shot enthusiasts. Note that the cumbersome Mauser bench rest action costs around $60.00 at present; this is not capable of handling the long British shells which are of interest to many single shot enthusiasts, and represent a large invest-

(Continued on Page Eighteen)

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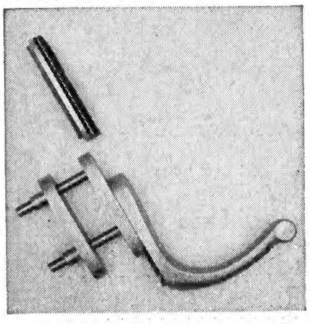

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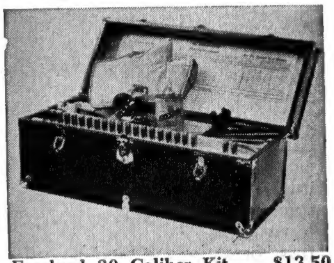

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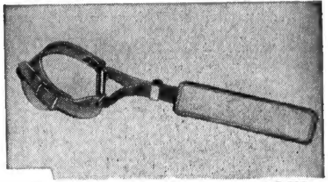

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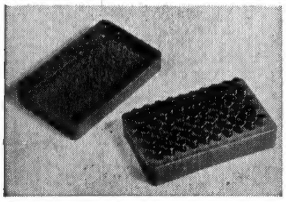

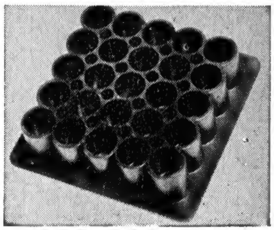

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Bull-Session Stuff

(Continued from Page Seventeen)

ment to the shooter. The trigger is not the best for varmint shooting, while a single shot falling block lends itself to a double set trigger very readily.

I might add here that the Heeron system is still being produced in Europe; similarly the Swiss are still making fine Martini actions, both of these actions being suitable for high power single shot varmint rifles.

Unless Mr. Hallberg could guarantee a large market for his single shot action I doubt if any major companies would be interested in tooling up. It might be that the companies producing replicas of the Civil War muzzle loading pistols could use their contacts in Europe to manufacture a good single shot **action.** Perhaps your readers have comments to add to my own. How about it?

Brian J. King
John Day Medical Center
John Day, Oregon

MISCELLANY

The various comments on the use of Teflon in issues of your magazine (to which I subscribe) have made me decide to write to you with some therewith connected observations.

I have used Teflon powder, which is available from a number of commercial firms, for necksizing operations. Generally you have to buy pound quantities, but the stuff is not all that expensive. The neck of the case is dipped into the greyish powder in the approved fashion and the Teflon neatly manages the expander button of the die without the mess of graphite or a liquid lubricant. Powdered mica does of course just as well, but is more expensive.

Over the last years I must have made thousands of jacketed bullets in my little ballistics lab, with die systems of various manufacturers, for calibers ranging from .172 to .338 (jackets courtesy of Ray Speer! You can't get them commercially yet). It is always with some surprise that I read or hear that one must be careful not to get too much lubricant on the tip of the jacket in the pointforming stage, or else you will get creases and dents. I do lubricate the jackets with my fingers, but I am always careful not to get any lubricant on that part of the jacket, near the mouth, which in pointforming becomes the bullet ogive. That part of the jacket doesn't need any lubricant! A very little of the stuff will get on anyway, as you shove the cored jacket into the die, from the predecessor, but the lubrication serves to make withdrawal of the formed bullet easy, that is after the expanding-up operation, when the cylindrical part of the bullet is in friction contact with the die hollow. The ogival part of the bullet obviously is not in contact with the die during withdrawal.

For the benefit of shooters who want yet another juice for cleaning their cases, the following is recommended, provided that reasonable care is exercised (for a start read the precautions on the label of the chromic acid can). A number of commercial preparations are based on this recipe:

Buy a 2 lbs. can of technical grade flaked chromic acid anhydride (dark orange flaked solid) from a chemical supply house. It is inexpensive.

Buy a 5 lbs. carton of technical grade Epsom Salts (Hydrated magnesium sulfate).

Fill a half-gallon container (glass, old wine jar is fine) which is set aside for that purpose only, with hot (Not boiling!) water, as it comes from the faucet; mix in 4 heaped tablespoons of the flaked chromic anhydride. Be careful not to spill either the solid or the solution; it is quite corrosive and, worse, staining. Don't get it on your hands, but if you do, wash it off without panic—it isn't all that dangerous.

Now mix in 6 heaped tablespoons of the Epsom salts. The resulting solution is referred to as "Liebig's Solution" and has been well-known to German chemists of the old schools for many years, to clean and restore brass laboratory instruments before varnishing. Nowadays you don't any longer use brass lab instruments as a rule.

The orange liquid is your cleaning solution and if used warm, will clean approximately 200 30-'06 cases real well, inside and outside. Leaves a matte golden finish. I generally prepare fresh solutions in just the quantities I need, every time I clean cases. You can store the solution but it is messy to warm up again later. It doesn't work too neatly when cold, although when fresh this isn't too noticeable, especially when few cases only are treated.

Dr. Edgar L. Eichhorn
Arcadia, California

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HOW NOT TO WIN

By Bill Purcell

Seems like everyone writing wants to tell about some marvelous discovery that gets all the shots in one hole and no one seems to remember the old adage that we learn by our mistakes. So, not being proud and having a fairly thick skin I take the negative and offer some suggestions on HOW NOT TO WIN A MATCH.

This spring I take my shooting irons out to Fassett's (Pa.) shiny new range to show the boys how it is done. Got a heavy varmint and a sporter but, being on the guaranteed low annual payroll, I got only one scope meeting the weight limit so I am swapping it between guns. Brother, believe me that don't work!

First change of scope I misread the windage adjustment—not on target—never did find it—"disqualified." Steel ain't solid, it moves and I went nuts chasing the zero all over the place until I drove the statisticians nuts by shooting all matches with the sporter. To complicate all this I didn't check out the heavy smokestick after a long dry winter and got a nice three inch group in the first match as it walked all over the target.

Then, to compound the confusion the sporter just barely stayed within the disqualifying lines. Friend Seymour had a bullet spinner and it showed that the bullets spun out at two thousandths (not tenths)! Need I say I won the booby spot.

So, remembering the Boy Scout motto "Go Prepared" I robbed the baby's bank and bought another scope. And what happened you wouldn't believe when I went to Jerry Arnold's second match! First, the new scope (not previously tested) shot a four inch group until I threw away the return spring. Next, cases began to stick because, being innocently inclined, to believe all I am told, had listened to a character who opined that best accuracy came from loads that busted primers. So for the next match loaded a batch of new cases only to get on the line and find that they would not chamber. Friend Shilen loaned me his gun and in five fast shots I added insult to injury by beating him in that match.

Next match, on account of gabbing while loading, I loaded magnum instead of regular .222 but fortunately had just five good loads but no sighters. Another lousy group! Next match I opine that these hot loads with ramrod extraction do not put me in a frame of mind suitable to shooting small groups so I cut the load. Unfortunately I got two hot loads in the block and on the way to the bench stumble and drop them. Fifteen loads—two bad—the odds look poor. Shoot one bad one on the sighter and the odds look better. First four record shots good and with eight left in the block the odds look good. Fifth, and I'm scragged again. Next match load carefully, get off four good ones and the fifth shell won't chamber. Grain of ball powder on the bullet and when extracted dumps a load of ball in the action. Brother, that's real trouble! Borrow a gun for the last shot from a kind friend. Zero is an inch out and I got, although by this time it does not matter, another three incher!

If you think my troubles are over you are wrong on account there is another match to go. Here I am, going pretty good, when friend Arnold, on the next bench, opines that someone has planted an extra shot on his target. The shot, being way out of my group, couldn't be mine, so I look down the line and venture that, for the next ten benches I can't find an A No. 1 stinker who would do a thing like that, Jerry, being a fine gentleman, did not scream. Get home and find my target for that match had just four holes! Did I? And did the target detail Goof?

Now such a sad tale must have a moral, in fact it has three:—

1. Be prepared before you go to a match.
2. Hope to learn from mistakes.
3. This is a free country and it is my inalienable right to be stupid if I want to.

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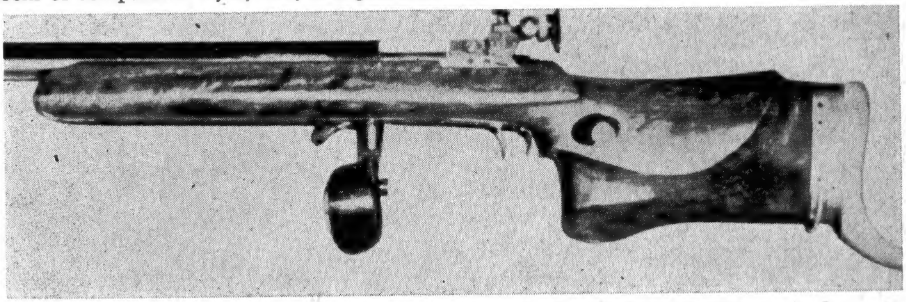

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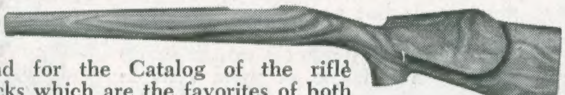

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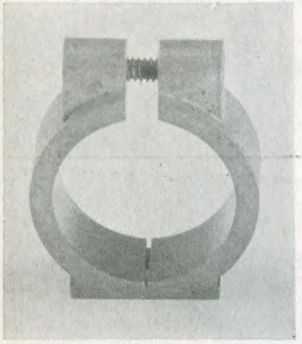

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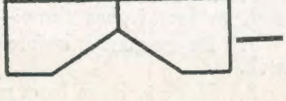

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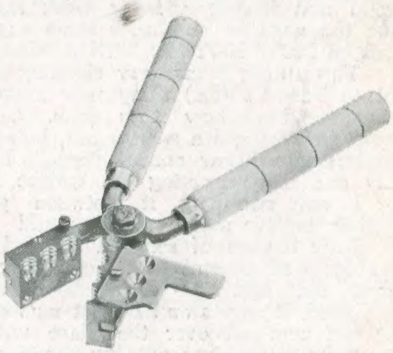

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